Dental

Abstracts

a selection of world dental literature

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SECTIONS

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Operative dentistry

The polishing of gold castings

Richard R. Troxell. *J.Pros.Den.* 9:668-675
July-Aug. 1959

For the past several years, a standardized procedure for polishing gold castings, developed by H. M. Tanner, has been used at the Naval Dental School in Bethesda, Md. The technic achieves more precise results than other polishing methods, it accomplishes the results more rapidly, and it can be learned easily.

The instruments (Fig. 1) are stored in a plastic block in the correct order of usage, as follows: a ¾ inch carborundum disk, a no. 2F Cratex rubber wheel, a ⅝ inch rubber sulci wheel, a no. 558 steel fissure bur, a no. 00 bud bur, a midget rubber sulci wheel (with a small-headed mandrel), a no. 0 bud finishing bur, a ¾ inch felt wheel, two ¾ inch soft wheel brushes, and a 1 inch rag wheel. A handpiece which produces mandrel speeds of 25,000 to 40,000 rpm is used. The following polishing procedure is utilized:

1. The sprue is cut off, the sprue pin attachment area is recontoured, and any rough surfaces are reduced with the ¾ inch carborundum separating disk.

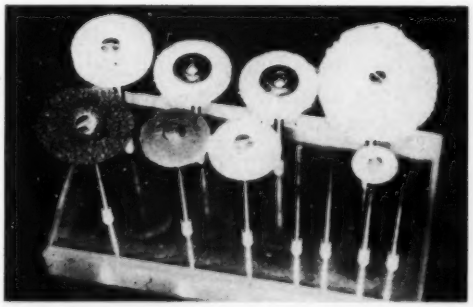


Figure 1 The instruments are stored in a plastic block in the correct order of usage

2. All axial surfaces are smoothed from the tips of the cusps to within 1 mm. of the margins, with the no. 2F Cratex rubber wheel, an abrasive instrument.

3. The surfaces are polished with the ⅝ inch rubber sulci wheel. Because of the coarse abrasive imbedded in the wheel, the instrument is not carried onto the occlusal surface or onto the 1 mm. space adjacent to the margins.

4. Finishing of the occlusal surfaces is initiated with the no. 558 steel bur. The side of the tip of the bur is placed into the grooves, and the grooves are defined by creating V-shaped cuts (Fig. 2).

5. A no. 00 bud bur is placed into the grooves and manipulated with a wiping or sweeping motion. Thus, the grooves are blended up onto the inclined planes, and the V-shaped cuts are softened.

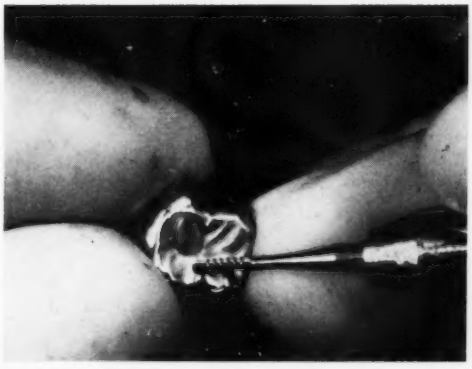


Figure 2 A no. 558 fissure bur defines the occlusal anatomic surfaces and creates V-shaped cuts

Figure 3 A microphotograph shows almost total light reflection from the finished surface

6. The midget sulci wheel is used to polish the grooves, fissures, spillways and the cuspal inclined planes.

7. The no. 0 bud finishing bur is manipulated in the same positions and in the same manner as was the no. 00 bud bur; this burnishes and smooths the grooves which were not reached by the midget sulci wheel.

8. The ⅝ inch felt wheel is used with tripoli to polish the axial surfaces of the casting from the tips of the cusps to within 1 mm. of the margins. When the proper sweeping motion and adequate pressures are used, the axial surfaces become highly polished.

9. A ⅝ inch soft wheel brush is used with tripoli to polish and initiate the final finish of the occlusal anatomy. During application of the wheel, the handpiece is rotated at maximum speed.

10. A ⅝ inch soft wheel brush is used with jewelers' rouge to complete the high polish of the occlusal surfaces.

11. The 1 inch rag wheel, used with very little rouge, is rotated at maximum speed and moved over all occlusal and axial surfaces to create the final high luster of the casting (Fig. 3).

U.S. Naval Dental School, Bethesda, Md.

Headache caused by contractions of masticatory muscles

Woodrow S. Monica. *J.M.Soc.New Jersey* 56:335-336 June 1959

Sustained contractions of the temporal muscles can cause head pain. In abnormal mouth habits, such as grinding, gritting and clenching, the masticatory muscles are stimulated beyond their physiologic function. These forceful and prolonged contractions may cause bilateral headaches.

Seven patients with bilateral headaches caused by abnormal grinding habits were treated successfully by dental rehabilitation. All had been treated by physicians for headaches for from one to ten years, and had obtained only temporary relief.

A 39 year old housewife complained of pain over the temporomandibular joint and of recurrent headaches in the suboccipital region. The headaches started ten years ago after the insertion of a gold crown on a lower anterior tooth. The gold crown felt "thick" to the patient. The patient ground her teeth at night and often clenched them during the day. In addition, she had a "chipmunk" appearance at the angles of the mandible. Her occlusion was adjusted at weekly intervals for three treatments. About two weeks after the last treatment, she was symptomless. One year later, she was asymptomatic and the "chipmunk" appearance had disappeared.

A 38 year old housewife complained of daily headaches in the temporal region. The headaches started five years ago. Her teeth were considerably worn from clenching and bruxism. Her occlusion was equilibrated in three sessions. Two weeks after the last adjustment, she was free of headache and has remained so for three years.

Bruxism usually is caused by malocclusion. When the abnormal tooth contacts are eliminated, the patient often ceases tooth grinding immediately. The "chipmunk" appearance is caused by hypertrophy of the masseter muscles.

310 Main Street, Orange, N.J.

The new rubber base impression materials: the importance of an early pour-up of the impressions

Donald F. Fournier. *Arizona D.J.* 5:76-79 June 1959

The manufacturers of rubber base impression materials claim that models may be poured at any time from 15 minutes to 4 days after the impression has been removed, with no effect on dimensional stability.

In this study, Coeflex and Neoplex (representative of two types of synthetic rubber base impression materials) were used; 426 impressions were taken; temperatures ranged from 69° to 77°F. A stainless steel die representing an ideal MOD inlay preparation was used. After the impressions had been taken, dies were poured in Duroc either in less than one hour, one hour, one day, two days, three days, four days, or five days after the impression had been removed.

Although the synthetic rubber base impression materials exhibit unusually favorable dimensional stability, dies showed distortion if poured one hour or more after the impression was taken. Less

than 10 per cent of the dies were distorted when poured within one day after the impressions were taken. The percentage of distorted dies increased in direct proportion to the delay beyond one hour in pouring. Less than half of the dies poured four days after the impressions were taken were acceptable.

It appears that the sooner the dies are poured after the impressions have been taken, the better the chance for an accurate die reproduction.

2623 East Turney Road, Phoenix, Ariz.

An experimental investigation into the effect of dental instruments on the enamel

Eruch B. Fanibunda. *D.Practitioner* 9:182-193 April 1959

The type of instrument most suitable for finishing the enamel margins appears mainly to be a matter of opinion based on clinical experience rather than experimental evidence. This study was undertaken to determine experimentally the effect of dental instruments on the enamel under simulated clinical conditions. In each instance, comparisons were made only between those instruments designed primarily for the same operation during a cavity preparation. The instruments were selected from those most generally used in standard operative procedures, and at least 12 preparations were finished with each instrument. Freshly extracted teeth were used, and the cavities were prepared on a phantom head.

The following conclusions were drawn:

1. The orientation of the blade of a cutting instrument in relation to the direction of enamel prisms plays an important role in deciding the type of edge and surface produced on the enamel.

2. The edge and surface produced by a grinding instrument depend on the surface of the instrument and are not affected by the direction of the enamel prisms. Modern diamond instruments have rough surfaces and therefore are not the best instruments for finishing the margins of a preparation. Proximal slices are most efficiently prepared with a diamond disk and subsequently smoothed with a steel "lightning" disk.

3. The crosscut fissure bur can be used for finishing the gingival edge of a proximal box preparation for an amalgam restoration, provided that space exists for its proper manipulation without damage to an adjacent tooth or restoration. An end-cutting bur with side blades is preferable.

4. Before the application of margin trimmers, the enamel surface should be made as smooth as possible with rotary instruments.

5. Of all instruments normally employed for finishing the enamel margins, the margin trimmer gave the smoothest possible finish when used as indicated.

The varied and contradictory conclusions of previous investigators may be attributed to the lack of uniformity among the procedures carried out by different authors. The fact that the same instrument is capable of producing varying types of edges and surfaces under different conditions has received insufficient attention.

Eastman Dental Hospital, London, England

Oncology

Office diagnosis of cancer of the head and neck

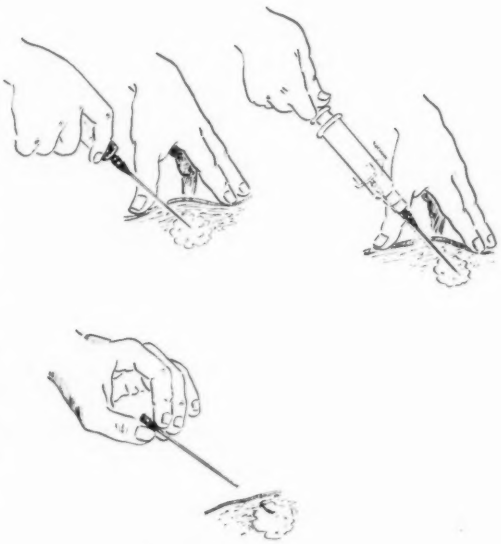
John C. Hardin, Jr. *Am.J.Surg.* 97:300-306 March 1959

The treatment of diseases of the head and neck is a field partially covered by many specialties but completely covered by none. Many malignant tumors of the mouth and accessible parts can be diagnosed early, thereby giving a good prognosis. However, more often than not the diagnosis is made somewhat late and the prognosis is poor. Early diagnosis, when the lesions are less than 2 cm. in diameter, is the main hope of improving the survival rate with present-day treatment.

If a patient has a tumor in the parotid gland, there is a 35 per cent chance that it is malignant; if in the submaxillary gland, there is a 55 per cent chance of malignancy. The infected salivary gland is hard and swollen but the malignant process is more acute; there is some tenderness, and pus often can be seen issuing from the orifice of the duct. Roentgenograms and occasionally sialograms are helpful in differentiating between salivary calculi with inflammatory swelling and tumors of the salivary glands. Sialograms are of little value in differentiating a benign from a malignant salivary tumor. The preferred roentgenographic views of the parotid gland should be the posteroanterior and oblique jaw views. Also, a dental film held in the vestibule of the mouth may outline a stone in the distal centimeter of the parotid duct. A 2 by 3 inch occlusal film of the floor of the mouth and oblique films of the jaw expose the region of the submaxillary gland and ducts.

A patient may complain of a painful lump in the neck. If the thyroid and midline masses are excluded, 80 per cent of the remaining neck masses (lateral neck masses) are neoplastic and most are metastatic from a primary lesion in the head and neck. Metastatic nodes frequently become necrotic in the center, producing fluctuant abscesses, and one must guard against treating them as abscesses and overlooking the possibility of cancer. Nodes in the neck should not be treated initially by excision. First, the head and neck must be examined thoroughly for a primary lesion. If none is found, an aspiration biopsy should be performed on the neck mass. If malignant cells are found, the search must be repeated for the primary lesion until it is found.

The technic of aspiration biopsy is simple (see illustration), requiring only a pointed scalpel blade, a large bore needle (15 to 16 gauge) and a 20 to 50 cc. syringe. After a small dose of a local anesthetic is administered, a stab wound is made through the skin so that the needle can be inserted in such a way that the specimen does not contain epithelial cells from the skin. While the mass is steadied with one hand, the needle attached to the syringe is inserted with a continuous twisting motion, such as in coring an apple. When it is believed that enough tissue has been cored out for the biospy specimen, the angle of insertion is changed so as to cut off the core from its attachment. The syringe then is removed and the needle withdrawn, taking care that the specimen



Technic of aspiration biopsy

is not drawn up into the syringe. The needle is reattached to the syringe and the tissue is expelled from the needle onto a slide. Another slide is pressed on top of the first, then quickly pulled away. If nothing but blood is seen on the slide, the procedure should be repeated. When a satisfactory slide is made, it is air dried and sent to the pathologist.

Examination of the oral cavity should be thorough, systematic, and made in a definite order, such as lip, buccal mucosa, upper buccal sulcus, upper gingiva, hard and soft palate going to the opposite upper buccal sulcus, buccal mucosa, lower buccal sulcus, lower gingiva, floor of mouth, superior and inferior aspects of tongue and so forth. A head light and a dental or laryngeal mirror are ideal instruments for an oral examination, but a tongue depressor and head mirror or flashlight may be adequate.

The one greatly neglected method of oral examination is palpation, which will reveal more of the character of a lesion than inspection alone. Bimanual palpation adds much to the value of the examination of the floor of the mouth, submaxillary gland and hypopharynx.

In the mouth, the early sign of cancer may appear only as an indurated plaque, a small granular ulcer or a fissured patch of leukoplakia. Most characteristic is a coarsely granular ulcer with indurated, raised, rolled edges. In oral and lip lesions the differential diagnosis includes syphilis and tuberculosis among other conditions.

The cardinal symptom of cancer of the larynx is hoarseness. The symptoms of cancer of the maxillary sinus appear late and occur only with invasion. The teeth may become loose and if they are extracted the lesion may grow rapidly out of the sockets. The classic symptoms of a nasopharyngeal malignancy are unilateral deafness, tinnitus, a slightly bloody postnasal discharge and a metastatic node at the angle of the jaw.

Cancer of the head and neck can be examined and diagnosed by a simple office procedure requiring only a few inexpensive instruments. However, the examiner must keep in mind the early symptoms of cancer of the head and neck, and investigate carefully the indicated anatomic region.

Physicians and Surgeons Building West, Shreveport, La.

Follicular cyst of the upper jaw surrounding an embedded molar: report of case

Antonio Tamburo de Bella. *Schweiz.Mschr. Zahnhk.* 69:124-128 Feb. 1959

A follicular cyst which at first was painless and unsuspected by the patient was detected by roentgenographic (tomographic) examination of a 19 year old boy.

There was extreme pain, intraoral deformity of the upper jaw, mobility of the left first permanent molar, and disturbance in the functions of the nose and left eye as the cyst extended into the maxillary sinus.

The tomogram revealed the presence of a molar and an atypical tooth element embedded within the cyst.

The obviously dentigerous cyst was a benign expanding lesion which destroyed the osseous tissue of the jaw and appeared in the tomogram as an isolated radiolucent area subdivided into smaller zones.

Treatment consisted of immediate extraction of the molar, marsupialization in which only the buccal wall of the cyst, the embedded tooth fragments and the involved part of the alveolar bone were removed. Healing was uneventful. One day after the surgical intervention, the pain abated. During the next two weeks, the patient remained under observation and was dismissed as cured after it was determined that adequate granulation had taken place.

Via Maqueda 272, Palermo, Italy

Brain procedure lessens cancer pain

M.News 5:10:2 May 27, 1959

A relatively simple brain operation to relieve intractable pain due to far-advanced cancer of the head and neck was advocated by Nicholas C. Wetzel, Jr., of the Northwestern University Medical School, in a presentation before the recent meeting of the American Society of Maxillofacial Surgeons. The operation produced encouraging results in 14 of 17 patients who had cancers of the gingivae, jaws, nose, throat, tonsils, larynx or facial skin.

The technic involves making a perforation two inches in diameter in the posterior fossa of the skull lifting aside the interposing brain tissue, and severing the appropriate nerves at their roots. Local anesthesia is employed. The operation requires about two hours.

In 10 of the 17 patients, both the trigeminal and glossopharyngeal nerves were sectioned; in four patients, only one of these two nerves was sectioned. In the other three patients, the sensory roots of the cranial and cervical nerves were severed. All but two of the patients died from local effects of their inoperable tumors within 35 months of operation.

Good relief of pain was achieved in 14 of the 17 patients.

"Too often, neurosurgery is undertaken in the terminal stages, rather than when the inoperable cancer is first discovered," said Dr. Wetzel. "Neurosurgical procedures should be performed before the patient is heavily sedated by narcotics, preferably just after the aspirin and codeine stage."

The procedure is not in itself disabling. If the patient's condition permits, he is out of bed in about two weeks, with no loss of neural function.

Northwestern University Medical School, Chicago, Ill.

The treatment of certain forms of lip precancer with garlic

D. M. Sergeev and I. D. Leonov.
Probl.Oncol. 4:216-218 March-April 1958

Cancer of the lip, especially of the lower lip, is preceded in 9.15 per cent of instances by precancerous conditions—usually by a circumscribed or, more rarely, diffuse hyperkeratosis followed by leukoplakia, fissures and ulceration. The treatment of these conditions by ointments, poultices or fomentations rarely leads to healing. In the search for other methods, the authors tested phytogenous agents, mainly garlic. The therapeutic action of garlic probably is linked both with its bactericidal and irritant properties which induce an aseptic inflammation in the region of the lesion. The clinical course of this inflammatory process resembles in many respects that of the process of normal wound healing.

One hundred and ninety-four outpatients with precancerous lesions of the lip were treated with garlic. There were 134 men (70 per cent) and 60 women (30 per cent). Circumscribed hyperkeratosis of the lower lip was found in 106 patients (54.6 per cent), leukoplakia in 64 (32.9 per cent), fissures in 14 (7.2 per cent) and ulcers in 7 patients (3.6 per cent); in 2 patients lip cancer was suspected.

The garlic was pulped in a mortar and the gruellike mass 0.2 to 0.3 cm. thick was placed on sterile gauze and applied to the lesion so as to include 0.5 cm. of healthy tissue. The gauze was secured by plaster for from 8 to 12 hours.

Healing occurred after a single application of garlic in 166 patients (80.5 per cent) and after a second application in 19 patients (12.7 per cent); that is, healing occurred in 93.2 per cent. In the other nine patients (6.8 per cent) the treatment was unsuccessful and they were given deep roentgenotherapy. After the garlic treatment, lip hyperkeratosis recurred in four patients who then were treated successfully by roentgenotherapy.

(Note by editor of *Problems of Oncology:* "The authors unfortunately do not include the results of more prolonged observations on the patients in whom an immediate curative effect was obtained. The method which they suggest needs careful checking. Garlic treatment can only be employed after a diagnosis of lip cancer has been completely excluded.")

Kirovograd Oblast Oncological Dispensary, Kirovograd, U.S.S.R.

Adamantinoma of the jaws: a clinicopathologic study of 101 histologically proved cases

J. K. Masson, J. R. McDonald and F. A. Figi.
Plast.&Reconstr.Surg. 23:510-525 May 1959

A study was made of 101 patients with histologically proved adamantinomas of the jaw encountered at the Mayo Clinic. When the tumors were classified microscopically, 67 were plexiform, 24 were squamous, 8 were glandular and 2 were sarcomalike. All types were capable of recurrence, and the number of recurrent lesions was directly proportional to the number of tumors in each class. The one instance of metastasis oc-

curred in an adamantinoma in which the squamous elements predominated; the secondary tumor in this patient involved a lymph node in the upper cervical region.

The youngest of the 101 patients was a 9 year old boy and the oldest was an 82 year old man. The average age for the entire group was 42.2 years, and the highest incidence was in those from 50 to 59 years old. Most other reports have stated that the greatest incidence is found in the third and fourth decades of life. In this series, the incidence increased with each decade through the sixth ten-year period, and then decreased abruptly in the seventh decade. The average age of the patients at the time of onset of symptoms was 33.5 years, and the average duration of the disease was 8.7 years.

Forty-six patients were male and 55 were female. Only one of the 101 patients gave a history of trauma; this was a 16 year old Negro boy who had injured his jaw while playing football. Exactly 55 patients gave histories of previous dental extractions; 5 patients had lost teeth and 2 complained of toothache; 9 patients had one or more unerupted or anomalous teeth present in the tumor or associated with it. Three tumors arose within a preformed cyst that apparently originated from the wall of the cyst.

The primary sympton in adamantinoma of the jaw is a tumor or swelling of the jaw. This occurred in 69 of the 101 patients. The swelling usually is painless; however, 15 patients complained of pain varying from moderate to severe. Draining sinuses were present in 16 patients and usually were subsequent to dental extractions. Four patients with tumors of the upper jaw gave nasal obstruction as one of their chief complaints.

Seventy-three patients had been subjected to previous surgical treatment.

The adamantinoma is a slowly growing, epithelial tumor most frequently involving the jaws, particularly the lower jaw. It occurs most often in middle life and in women slightly more frequently than in men. It recurs after incomplete removal in almost 100 per cent of instances, and it is capable of invading soft tissue. Whether it is a malignant lesion is debatable; generally the lesion is benign, with a characteristic tendency to recur.

Mayo Clinic, Rochester, Minn.

Metastasis to the jaws

P. Phillip Gross. *Pennsylvania D.J.* 26:4:3-5 April 1959

Metastasis to the maxilla and mandible, arising from a viable cancer cell embolus transported via the blood stream from a primary or secondary cancer elsewhere in the body, is comparatively rare. Skeletal surveys often fail to include the maxilla and the mandible, and many metastatic lesions are missed. Carcinoma of the breast, prostate, ovary, kidney, thyroid, lung, testicle and rectum tends to metastasize to the bones and so may involve the jaws.

Castigliano and Rominger (1954), reviewing the literature from 1902 to 1953, found 176 cases reported of metastasis to the jaws. Since 1953 ten more cases have been found.

The metastatic tumor may be osteolytic or osteoblastic. Certain tumors, such as those from the thyroid, kidney and lung, are osteolytic whereas others, such as those from the prostate, characteristically are osteoblastic.

The patient with a metastatic tumor of the jaw usually is one with advanced carcinomatosis, the primary site of which generally is known from the history of the patient. In metastasis to the jaw, pain is present from the outset and usually is mistaken for toothache, neuralgia or pain of the rheumatic type. Pain with neurologic symptoms, such as paresthesia of the lips, is the primary symptom of metastasis to the jaw. An interesting feature of a metastatic lesion is that the histologic structure sometimes is more typical of the tumor from which it arises than that of the primary tumor.

The dentist should have a high index of suspicion in regard to instances of delayed postoperative healing of extraction wounds. If a patient has had a loose tooth removed and yet has not had relief from pain, the situation should not be treated lightly. Pain, loosening of teeth, paresthesia and roentgenographic changes of the osseous tissue surrounding a tooth should make one suspicious of malignancy.

Nine case reports illustrate metastases to the jaws from primary tumors in the breast, rectum, kidney, adrenal gland and testicle.

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Oral surgery

Fixation of fractures of the jaws: a new and simple method

Ada Per-Kuklinska and Bronislawa Stryla-Rossowa. *Czas.stomat.* 11:819-829 Dec. 1958

During the last two years (1956 and 1957), 1,903 patients with fractures of the jaws were treated at the clinic for oral surgery of the Medical Academy of Zabrze, Poland.

A newly developed and comparatively simple method of permanent horizontal fixation was used almost routinely. The appliance, individually constructed, consisted of wire splints and rings made of stainless steel.

Stainless steel wire (0.7 mm.) was bent to form several loops which were turned at an angle of 90 degrees and attached to the rings. Splints and rings were fixed lingually to the teeth adjacent to the fracture line. Dental floss and the loops then were inserted labially between the teeth. The distal end of the wire was passed through the loops which then were twisted.

This type of splinting has been employed for both intermaxillary fixation or an elastic immobilization. In isolated instances the wire splints were twisted across the fracture line, thereby obtaining the desired retention of the fragments without fixation of the entire jaw.

Clinical experience proved that this method of fragment immobilization is indicated especially for treatment of jaw fractures in patients in whom a sufficient number of teeth is present. It was used, however, for splinting of all simple jaw fractures (21.3 per cent).

In fractures of edentulous jaws, it was necessary to modify the method. The teeth of artificial dentures were used in place of natural teeth. This was done either directly by applying the splints to the denture (1.3 per cent) or indirectly by use of circular splints (3.1 per cent).

Splints of Weber's type (1.8 per cent) or of Gunning-Ports type (3.5 per cent) were used in instances in which either multiple fractures were present or great tooth losses had occurred. In all instances, extreme caution was exercised in determining the number of fractures actually present which was not always identical with the number of fracture lines appearing in the roentgenograms.

The results of the treatment, esthetically as well as functionally, can be called satisfactory, especially considering the fact that in the majority of instances severe trauma had been experienced.

After seemingly satisfactory splinting and healing, however, 243 patients required additional orthodontic treatment.

A team, consisting of the clinic's oral surgeon, orthodontist and prosthodontist and the academy's orthopedist, otolaryngologist, neurosurgeon, hematologist, roentgenologist and anesthetist, worked in cooperation and played an important role in diagnosis and treatment.

Constant postoperative care by experienced nurses aided significantly in the recovery of all patients.

Ulica Bankowa 11, Gliwice, Poland

Diagnosis of mandibular fractures by auscultation with percussion

Marsh Robinson. *Oral Surg.,Oral Med. & Oral Path.* 12:173-174 Feb. 1959

With a little practice, the oral surgeon can master the technic of auscultatory percussion to determine the presence of a fracture of the mandible.

The bell of the stethoscope is placed firmly over the symphysis and is held there by the patient. This leaves the right and left hands of the examiner free to percuss. Three taps are given alternately on the right and left sides of the face. The examiner taps first over the zygomatic arches, then over the condyles, and finally over the angles. If there is loss of bone continuity between the area of percussion and the symphysis (area of auscultation), the examiner will hear a dull note.

The test should be done with the teeth not in contact. The pad of the examiner's middle finger is used as the plexor. The stroke should imitate a

piano hammer. It should be a perpendicular stroke. The quicker the percussing finger is withdrawn after striking, the clearer will be the note obtained. The surgeon's whole attention should be concentrated on listening. Any surgeon with normal hearing acuity can train his ear to differentiate between the sound transmitted through uninterrupted bone and through a fractured bone.

3003 Santa Monica Boulevard, Santa Monica, Calif.

Wound healing: an evaluation of surgical suture materials

R. W. Postlethwait, James F. Schauble, M. L. Dillon and Jean Morgan. *Surg.Gynec.& Obst.* 108:555-566 May 1959

The ideal surgical suture would consist of material which could be used in any operation, the only variable being the size as determined by the required tensile strength. It should allow comfortable and natural manipulation. Tissue reaction should be minimal and should not favor bacterial growth. Tensile strength should be high. Knots should hold without fraying or cutting. Sutures should be easy to thread. The material should be nonelectrolytic, noncapillary, nonallergenic and noncarcinogenic. The suture material should be inexpensive and should not shrink. Sterilization should be obtained easily by boiling or autoclaving without structural alteration. Obviously, the ideal suture material is not available.

The available surgical suture materials were investigated by using four criteria: (1) tensile strength; (2) histologic reactions; (3) structural changes after suturing, and (4) histologic grading of tissue reactions caused by the suture. The following materials were studied: (1) no. 0000 chromic catgut; (2) no. 00 chromic catgut; (3) no. 00 plain catgut; (4) no. 0000 silk; (5) no. 00 silk; (6) no. 1 silk; (7) no. 0000 cotton; (8) Dacron; (9) Teflon; (10) nylon; (11) Nymo; (12) ramie, and (13) no. 32 stainless steel wire.

New Zealand rabbits from six to seven months old were used as experimental animals. All operations were performed under aseptic conditions. At intervals of 2, 4, 7, 14, 28 and 42 days the animals were anesthetized and the surgical wounds exposed. Two hundred and eighty-seven rabbits were studied, which provided 842 wound tensile strength determinations, 745 suture tensile strength determinations, 272 tissue reaction determinations and 1,179 sutures for histologic grading.

The results were as follows:

1. Catgut sutures proved to be equal in value to the synthetic sutures prior to absorption.

2. After absorption, the tissue reaction increased and the tensile strength of catgut sutures decreased.

3. Synthetic sutures, especially Teflon, caused little tissue reaction and maintained tensile strength adequately.

4. In synthetic sutures, the tendency of the knots to untie and slip was a disadvantage, but their other properties were so favorable that some alterations in the material should be sought to produce dependable knots.

5. Ramie was similar to cotton in tissue reaction, but lost tensile strength two weeks after insertion. This material is difficult to manipulate after sterilization and, therefore, cannot be considered as a suitable suture material.

6. Dacron, Nymo and nylon stimulate little tissue reaction, maintain adequate tensile strength and sterilize without significant structural changes. In all these synthetic sutures the tendency of the knots to slip is a disadvantage.

7. Teflon stimulates the least tissue reaction and its tensile strength is satisfactory. As with the other synthetic sutures, some alteration of Teflin is required to make the knots more dependable. The other properties of Teflon are so favorable that further work to overcome this one disadvantage should prove to be worthwhile.

Veterans Administration Hospital, Durham, N.C.

Multiple symmetrical tumors in the oral cavity

V. Haenselt and H. Flock. *Arch.Geschwulstforsch.* 12:352-358 Dec. 1958

During a five-year period, the following four separate and symmetrical tumors were observed in the oral cavity of an adolescent patient: (1) a neuroma on the left edge of the tongue; (2) a

melanocytoblastoma on the right edge of the tongue; (3) a melanocytoblastoma in the left tonsil, and (4) a melanocytoblastoma, of similar size, in the right tonsil.

The neuroma, a myelinic neuroma, consisted of myelinated nerve fibers and was, therefore, typical. The melanocytoblastomas, however, were atypical, because they were surrounded by small satellite lesions which did not appreciably change in size or appearance during the five years.

These findings demonstrated several interesting points: (1) in spite of the rarity of melanocytoblastomas in the oral cavity, these malignant tumors may occur in multiple form; (2) the location of the tumors is symmetrical, and (3) they may be associated with the development of a neuroma in preblastomatose melanosis. These tumors arise from connective or ectodermal tissue elements and are unpredictable in their course, because some of them are highly malignant whereas others, with an identical histologic picture, are relatively benign.

Usually, immediate local excision and regional lymph node dissection will result in a five year cure in approximately 80 per cent of patients.

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The treatment of oral hemangiomas: report of four cases

Robert W. Christensen. *Oral Surg.,Oral Med. & Oral Path.* 12:912-921 Aug. 1959

The hemangioma, a tumor composed of blood vessels, may be congenital or it may form later in life. It may gain considerable size and when it does it may be difficult to treat. Hemangiomas may appear in various regions of the oral cavity or face and in many other areas of the body. They may arise in bone, but more frequently they arise in soft tissue areas and then may invade bone. Hemangiomas are most frequently found on the lip, tongue and buccal mucosa. Hemangiomas near the mucosal or epithelial surface usually are raised, lobulated, purplish, compressible, and sometimes pulsating.

Treatment methods depend on the tumor's size, duration, location and structural pattern, and on the age of the patient when the tumor first appeared. Treatment may consist of excision, radiation, application of carbon dioxide snow, injection with a sclerosing solution, or a combination of these forms of treatment. For hemangiomas in the oral region, surgical excision or injection of sclerosing solutions is preferred to radiation, especially in children.

In the four cases reported, three patients were treated by injections of a sclerosing solution and one patient was treated by total excision of the tumor. No recurrence was found.

In the first patient, a six year old girl, the inadvertent injection of a radiopaque contrast medium into the afferent vessel of the hemangioma made the tumor visible roentgenographically. This permitted the effectiveness of the injections of a sclerosing solution to be visualized. The hemangioma was on the right side of the chin and measured about 5.0 cm. horizontally, 3.0 cm. vertically, and seemed to bulge about 2.0 cm. laterally. Two injections of 0.5 cc. of sodium morrhuate, one week apart, were made into the tumor mass. The size of the tumor was greatly reduced, and no more injections were made; one year later, the tumor could be neither visualized nor palpated.

An 18 year old marine was brought to the oral surgery clinic. He had a hemangioma of the left inner commissure of the lip and adjacent buccal mucosa. It measured 2.5 by 2.0 cm. and had been present since the patient was 3 years old. On two occasions one week apart, the tumor was injected with 0.37 cc. of sodium morrhuate and the tumor disappeared almost completely.

A 32 year old Negro woman had a purplish tumor in the left lower mucobuccal fold adjacent to the lower first bicuspid. The tumor had been present as long as the patient could remember. Two injections of 0.5 cc. of sodium morrhuate, one week apart, resulted in the complete disappearance of the tumor within one month after the first injection. The patient has been observed for two years, with no recurrence of the tumor.

A 53 year old man had a small, raised, circumscribed, pulsating growth on the right side of the lip at the mucocutaneous border. It had been present since his youth and was a nuisance when the patient shaved. It was removed by total excision under local anesthesia. Healing was uneventful and the tumor did not recur.

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Endodontics

An inexpensive endodontic incubator

Gary D. Schuller. *M.Technicians Bul.* 10:161-163 July-Aug. 1959

Supplies needed to construct a simple endodontic incubator (see illustration) at minimum cost consist of the following: one empty alginate impression powder can; one lamp socket with a turn switch or push switch; several feet of lamp cord with an ordinary two-pronged plug on one end; one household thermometer accurate within two degrees; one piece of celluloid, or exposed (clear) x-ray film, 2 by 3 inches; one package of pipe cleaners; three light bulbs (one each of 7½, 10 and 15 watts), several feet of friction tape and several feet of masking tape.

The steps in construction are as follows:

1. A round hole is cut in the lid of the can. The hole should be large enough for the small end of the lamp socket to fit through and yet small enough so that the larger diameter of the middle of the socket cannot pass through.

2. A window, 1½ by 2½ inches, is cut in the side of the can at a level even with the 90° to 110°F. range of the thermometer mounted inside the can. The window is covered from the inside with the celluloid which is secured with masking tape.

3. A no. 702 steel bur is used to cut several small holes in the top of the can and the upper part of its side, for air circulation.

4. A holder for three or four test tubes is fashioned from the pipe cleaners and secured on the inside of the can, along with the thermometer. Masking tape is used to secure both the rack and the thermometer; both should be visible from the outside through the window.

5. A safe electrical connection is made with the free end of the lamp cord and the lamp socket.

6. The lamp socket is placed in the hole provided with the bulb end into the can. Friction tape is wound around the part of the socket which is inserted through the hole, and the tape is overlapped onto the under surface of the lid to secure the socket firmly in place.

Inexpensive endodontic incubator is simple to make

7. Each of the bulbs is tested in the socket, and a check is made to make sure that the thermometer and test tube rack still are visible through the window.

The incubator is placed where the room temperature is fairly constant throughout the day and night. Several 24-hour tests are run with the various bulbs to learn which bulb is needed to maintain the temperature within the incubator between 96° and 101°F. To adjust for changes in the outside temperature, it is necessary at times to change the bulb strength. The operator soon is able to judge when to use each different bulb. With this incubator it is possible to culture material from root canals.

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Anesthesia and analgesia

Pharmacological and toxicological evaluation of a new local anesthetic, dl-N-methylpipecolyl-2,6-xylidide

Aldo P. Truant and Sten Wiedling.
Acta chir.scandinav. 116:351-361 May-June 1959

Among the recently introduced local anesthetics there are a few with a chemical structure related to lidocaine. The latest of these lidocaine analogues is dl-N-methylpipecolyl-2,6-xylidide. This compound, which lacks an official or generic name, is referred to as "MPX." It has shown a comparatively low toxicity, rapid onset, high incidence and long duration of anesthesia.

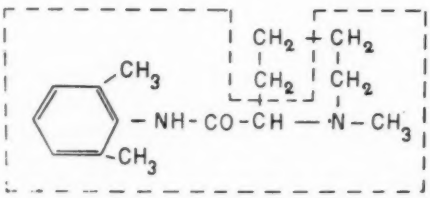
Some of the pharmacological properties of MPX have been investigated by H. R. Ulfendahl (1957) and M. Frahm (1958). Recently the pharmacological and toxicological properties of MPX have been investigated at the Research Laboratories of AB Astra in Södertälje, Sweden. In view of the structural similarity to lidocaine, it was natural that the latter was chosen as a reference standard.

The structural formulas for MPX and lidocaine are compared in the illustration. The structural similarities between the two anesthetics become more evident if three-dimensional molecular models of the Start-Briegleb type are used.

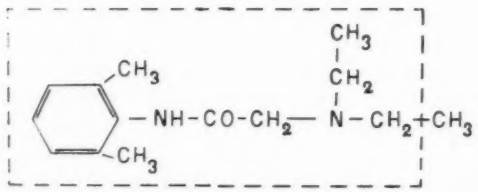
In comparing the local anesthetic properties of MPX in relation to those of lidocaine, it is important to study them from different viewpoints. The method selected to determine the relative potency of both anesthetic agents was the action-potential technic. It permitted direct and objective measurements of the onset, degree and duration of the impulse blockade, and provided information regarding the potential incidence of clinical anesthesia. Certain in vivo technics such as (1) the sciatic nerve blocks (in frogs and rats); (2) the intradermal and subcutaneous infiltration anesthesia (in rabbits), and (3) the corneal anesthesia (in rabbits and guinea pigs) for the comparison of the two local anesthetics were used. Altogether, 192 experiments were carried out on 41 nerve preparations.

The effect of MPX on the blood pressure was compared with that of lidocaine by using intravenous administration in amobarbital-anesthetized rabbits, both without epinephrine and in combination with two different concentrations of epinephrine. There was no noticeable difference between MPX and lidocaine in the effect on blood pressure so far as the slight lowering of blood pressure with the solutions without epinephrine was concerned or the elevation of blood pressure with the solutions containing epinephrine.

The acute toxicity of MPX was determined by intravenous, intraperitoneal and subcutaneous administration in male albino mice weighing approximately 20 Gm. The toxicity of MPX was from 20 to 40 per cent higher than that of lidocaine.



dl-N-Methylpipecolyl-2,6-xylidide (MPX)



Xylocaine

After comparing the effects of the two anesthetics in regard to sciatic nerve block, infiltration anesthesia, topical anesthesia, blood pressure, toxicity (acute, nerve and tissue) and recovery, the following conclusions were drawn:

1. Differences were demonstrated, all to the advantage of lidocaine.

2. No difference between the two drugs was demonstrated in the effect on blood pressure either with or without epinephrine.

3. The acute toxicity of MPX tested by intravenous, intraperitoneal and subcutaneous injections in mice was found to be higher than that of lidocaine. A pronounced delayed toxicity was observed on subcutaneous administration of MPX which, unlike lidocaine, exhibited a certain degree of nerve toxicity.

Research Laboratories of AB Astra, Södertälje, Sweden

Care of the teeth during anesthesia

William H. L. Dornette and B. H. Hughes.
Anesth.& Analg. 38:206-215 May-June 1959

The administration of general anesthetics necessitates a certain amount of manipulation or instrumentation about the mouth. A knowledge of proper dental care thus is important to every anesthesiologist. Each of the various patient age groups presents different dental conditions and problems in care.

In laryngoscopy in infants whose deciduous teeth have not yet erupted, it is important to avoid undue pressure of the laryngoscope blade against the gingiva. Excessive pressure may damage unerupted teeth. Laceration of the gingiva by the sharp edges of blades must be avoided. If bite-blocks are used, they should be moistened with water or lubricated with a small amount of oil soluble ointment; this prevents damage to the biting surfaces of the gingiva.

The anesthesiologist must treat deciduous teeth as though they were permanent. Excessive pressure on a deciduous tooth—especially on an incisor—may damage the underlying, undeveloped permanent tooth. Such injury can result in noneruption or in malalignment. Bite-blocks should be used judiciously in patients in this dental age group, and should be placed preferably in opposition to the molars rather than the incisors. If the patient is wearing a removable space maintainer, this device should be removed prior to induction of anesthesia. The fixed type of space maintainer should be protected during laryngoscopy and maintenance of the bite-block.

The deciduous teeth usually begin to exfoliate at four years of age, and exfoliation is complete when the patient is about 11 years old. Before administering an anesthetic agent to a patient of this age range, the anesthesiologist should examine the patient's mouth carefully for loose deciduous teeth. Removal of such teeth before or during anesthesia may be indicated.

The permanent teeth erupt between the ages of 5 and 18 years. The importance of proper care of the permanent teeth during anesthesia is obvious. The anesthesiologist should inspect the teeth of all patients before general anesthesia, and even before regional anesthesia, since permanent teeth may be loose, and there may be one or more types of prostheses which may require his special attention.

Many anesthesiologists are in the habit of using an oropharyngeal airway to prop the jaws apart. This practice is illogical, dangerous and should be condemned.

When the jaws are partially opened, as they are during the use of a bite-block, the orifice between the teeth is wider in the midline and becomes narrower at each side. A bite-block placed in the midline will afford less effective spread of the jaws than one placed on either side between bicuspid and molar. There are other, anatomic reasons that contraindicate placement of a bite-block between the incisors.

If a patient has a removable orthodontic appliance, this should be removed before induction of anesthesia. The anesthetist should examine the patient's teeth thoroughly and question the patient as to the presence of prostheses. The five types of prosthetic appliances which the anesthesiologist may encounter are the individual crown, fixed bridge, removable partial denture, complete denture, and the implant denture.

If the anesthesiologist finds it necessary to remove dentures in the operating or recovery room, he alone should assume responsibility for the proper care of the appliance and its safe delivery to the patient's room. The anesthesiologist must

develop a routine for caring for removable dentures, so that there can be no chance of their becoming lost or damaged. If a permanent tooth or prosthetic appliance is chipped, fractured or otherwise damaged, the patient should be told at the earliest possible time. Responsibility for payment of repairs is a matter to be decided by individual circumstances.

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Progressive relaxation

William Dembroff. *Brit.J.M.Hypnotism* 10:41-46 Spring 1959

The dental patient who is nervous or frightened usually is the best subject for hypnosis. Because many patients are antagonistic to the word "sleep," the term "progressive relaxation" may be used. The patient is told that he will be taught to relax.

Twelve case reports illustrate the hypnotic technic of progressive relaxation for patients undergoing extractions, restorations, gingivectomies and pulpotomies. Posthypnotic suggestions are used to control pain and swelling.

With children, the word "sleep" is used because most children would not understand the term "progressive relaxation."

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Death during anesthesia

Lancet No. 7050:803 Oct. 11, 1958

After having five teeth extracted, a six year old boy died from cardiac arrest due to shock resulting from a change in anesthetics, it was stated at an inquest in Manchester. The city coroner recorded a verdict of death by misadventure.

The dentist said he first had administered nitrous oxide and then trichloroethylene. He removed three teeth and noticed that the boy was regaining consciousness. For five seconds he administered ethyl chloride and removed two more teeth. The boy's respiration became shallow and he was given oxygen, but he collapsed and died.

Replying to the coroner, the dentist said he knew there was a strong opinion among dentists about the dangers of trichloroethylene and ethyl chloride, but that he did not think there was any risk in this situation, as the boy was strong and healthy. He agreed, however, that there would have been less risk had he continued to administer the nitrous oxide. In his opinion it was the ethyl chloride that caused the boy's death.

A consultant anesthetist said that what the dentist had done was widely practiced provided that patients were not susceptible to a sudden change in anesthetics. To some patients, such as invalids or young children, trichloroethylene could be dangerous and ethyl chloride slightly more dangerous. The consulting anesthetist said it would have been safer to have kept on with the nitrous oxide.

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An evaluation of general anaesthetic techniques for use in the dental surgery

W. S. McConnell. *Proc.Roy.Soc.Med.* 52:323-330 May 1959

The quality of chairside anesthesia often falls short of that which is achieved in an operating theater. In the operating theater the anesthetist need only inject more of a selected drug into an open vein or alter the contents of the mixture inspired by or squeezed into the patient. Furthermore, he has available all the details of the patient's medical history and the results of any investigations. At chairside the anesthetist may feel impotent and ignorant.

If better operating conditions are not provided by general practitioners or anesthetists, the dental surgeons will give their own anesthetics. There already are several societies whose aim is to train dentists in anesthetic technics at the chairside.

It is doubtful whether an ideal universal dental anesthetic will be evolved, for two reasons: (1) the variations in age, nature and whims of the patients, and (2) the extent and difficulty of the dental work in relation to the skill of the operator. The anesthetic must be tailored both to the patient and to the skill of the operator.

Ninety per cent of children are cooperative; therefore, the routine sedation of all young pa-

tients is not justified. The advantages of preanesthetic sedation are (1) the ability to turn an uncooperative child into one who will submit to inhalation anesthesia, and (2) the fact that such sedation permits a higher proportion of oxygen to be given during nitrous oxide anesthesia. The drawbacks to sedation are the added time and trouble required in administration, and the occasional unpleasant aftereffects.

In adults, provided there is no contraindication, the author favors using an intravenous agent in the borderline apprehensive patient.

For the extraction of teeth in babies and children up to four years old, the duration of anesthesia required is brief; it is unwise and unnecessary to use sedation with resultant drowsiness for some hours. Of the anesthetic agents in common use for babies and small children, vinyl ether provides freedom from anxiety during anesthesia, and aftereffects are almost wholly absent. Should the operation demand a longer period of anesthesia, nasal nitrous oxide and oxygen can be given from the moment the vinyl ether inhaler is removed.

The five year old child of average size may be given nitrous oxide and oxygen supplemented by vinyl ether. For children in their teens, unassisted nitrous oxide and oxygen is satisfactory.

The author for 26 years has used intravenous injections of barbiturates to produce anesthesia in selected patients seated upright in the dental chair. The untoward events which have followed this practice have not been sufficiently serious or frequent to question the technic. Intravenous barbiturates are used in 15 per cent of the patients. Thiopental sodium is used for resistant adults, patients who are intolerant of inhalation anesthesia, and patients with cardiac or respiratory insufficiency. Old age is not a contraindication but with the octogenarian patient the total dose is limited to 250 mg. delivered with a 22 gauge needle.

The barbiturates are poor analgesics, and therefore more than a hypnotic dose must be given if the patient is not to feel and respond to pain. The onset of laryngeal spasm is an ever-present threat to a good airway. The signs of developing spasm can be recognized in 1 in 100 cases; it is important to coax oxygen past the closing cords at the first crowing sound.

The analgesic effect of meperidine hydrochloride can be used as a valuable supplement to nitrous oxide anesthesia. If an intravenous injection of 25 to 50 mg. of meperidine is given five minutes before nitrous oxide anesthesia is induced, the patient will not respond to painful stimuli even though the oxygen content of the maintenance mixture of nitrous oxide is high. In the dosage suggested, meperidine does not prolong the recovery period or produce any unpleasant subjective sensations. In the author's experience, intravenous meperidine is a safe and useful drug; in the event of a relative overdose being given, a reliable antagonist (nalorphine hydrochloride) is available.

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Dental treatment of mentally retarded children under general anesthesia

H. Neiditsch. *Schweiz.Mschr.Zahnhk.* 69:48-50 Jan. 1959

One of the most difficult problems in pedodontics is the treatment of mentally retarded children who usually are not willing or able to cooperate. Because in the past many of these children could not be treated adequately, they often did not receive the dental service required.

By using general anesthesia it is now possible for the pedodontist to rehabilitate the mouth satisfactorily in mentally retarded children or children otherwise difficult to manage. At the oral surgical clinic of the Children's Hospital in Basel, Switzerland, most dental procedures in such patients are completed in one sitting.

Before anesthesia is attempted, every patient is given a thorough physical examination. If the temperature is higher than 37°C., all dental procedures are postponed.

During oral surgical interventions, performed under general anesthesia, the body temperature often rises suddenly, necessitating hastening or stopping the treatment. If such a temperature rise is associated with oral or dental infections, antibiotic therapy should be initiated. The anesthetic and operative procedures, however, can be continued.

Proper premedication (pentobarbital and promethazine combined with hyoscyamine), administered one and one-half hours prior to anesthesia, reduces the amount of the anesthetic agent required and permits a general anesthesia at a smoother plane.

The endotracheal method proved successful in inducing general anesthesia in mentally retarded children and in children suffering from cerebral palsy.

Anesthetic combinations of ethylene or cyclopropane and oygen as well as ether and vinyl ether should be avoided because of the hazard of explosion caused by sparks. Nitrous oxide and oxygen (in a 2 to 1 proportion) and trichloroethylene (Trilene) as a supplement are recommended. This combination of anesthetic agents and muscle relaxants provided a flawless anesthesia permitting satisfactory operative results and an early discharge of the patient.

Utilizing general anesthesia in pedodontics makes it possible to perform excellent dental work on all types of uncooperative and difficult to manage children, especially those who are mentally retarded or suffer from cerebral palsy. These children cannot be treated in a routine manner.

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Dentists in medical anesthesiology

Bruce L. Douglas. *J.Am.D.Soc.Anesthesiology* 6:6:14-15 June-July 1959

The American Society of Anesthesiologists' committee on liaison with American dental anesthetists has submitted a report proposing in part that the society encourage dentists who desire to administer dental anesthesia to take postgraduate training, and that the society assist in establishing one-year residencies for dental trainees. The report further proposes that the American Dental Society of Anesthesiology cooperate by: (1) insisting that dental practitioners administer anesthesia for dental operations only, and disciplining dentists who do not conform; (2) discouraging dentists from administering general anesthesia without special postgraduate training, and (3) listing with the American Society of Anesthesiologists as exceptions those dentists who have specialized in anesthesia for many years. (The report was not acted on at the last meeting of the American Society of Anesthesiologists' House of Delegates.)

The proposed "grandfather clause" results from the fact that years ago, when there was a shortage of trained anesthesiologists, a number of dentists with training in anesthesiology entered the field; some continued to practice medical anesthesiology because they were accepted by local medical and hospital authorities. The grandfather clause does not apply to recent dental graduates or to dentists who have completed anesthesiology training in recent years.

The American Dental Society of Anesthesiology must insist in its own areas that dentists who have been trained in anesthesiology use their knowledge solely for the practice of anesthesiology in dentistry. Encouragement by physicians who may be short of professional anesthesia personnel in their particular hospitals or groups is no excuse for a dentist to enter the practice of medical anesthesiology. Administering anesthesia for other than dental operations is the practice of medicine and exposes the dentist to possible legal action. It also undermines the efforts of the American Dental Society of Anesthesiology to establish a firm, cooperative relationship with the American Society of Anesthesiologists.

The only exception to the participation of dentists in general surgical anesthesia is under recognized training auspices. Hospital operating room training is important in the dentist's postgraduate education in anesthesiology, but it must be acknowledged by the dentist that such training is solely to provide him with a firm foundation for the use of anesthesia in dental procedures.

If the needed training centers around the country are to be established, the American Dental Society of Anesthesiology needs the cooperation of the American Society of Anesthesiologists and of the physician anesthesiologists who direct anesthesia training programs in hospitals. The American Dental Society of Anesthesiology must condemn the practice of medical anesthesiology by dentists.

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Roentgenology

Reduction of radiation hazards in dental radiography

John A. Campbell, *J.Indiana D.A.* 38:143-149 April 1959

Technical means now are available, and others likely are to become available in the near future, whereby the risk of damage to the somatic and germinal tissues of professional personnel and patients in carrying out dental roentgenographic procedures can be reduced.

Among the precautionary methods now available are the following simple, inexpensive and practical procedures.

1. Avoidance of all unnecessary exposure. No roentgenographic examination should be performed unless there is a sound reason for doing it.

2. Provision of adequate lead protection of the tube housing to eliminate stray radiation from this source.

3. Protection of professional personnel by the use of protective barriers around the x-ray machine, by intelligent location of the controls, and by use of an extra long cord on the timer switch.

4. Tying a protective lead fiber glass apron about the patient's neck and draping the apron to cover the lower part of the body.

5. Collimation of the primary beam to restrict the incident ray to the part being examined. A double diaphragmed cone prevents undesirable spread of the beam and improves film image quality by reducing secondary radiation.

6. Increasing the length of the cone from 8 to 16 inches; this reduces the amount of radiation required by about 20 per cent, with less magnified distortion of the film image and no reduction of density.

7. Use of extra-fast film emulsions.

8. Increasing the filtration of the primary beam. As much as 3 mm. of aluminum filtration may be added to the primary roentgen-ray beam of a dental x-ray machine utilizing 75 to 90 kv. without significantly affecting the image quality. This will reduce the radiation exposure to the patient as much as 55 to 74 per cent from that of a nonfiltered beam.

9. Processing the films in the developing solution for a full seven minutes instead of three minutes, at 68°F. This can result in another 33 per cent reduction in roentgen-ray exposure dosage. A further 20 per cent reduction can be obtained by using the faster phenidone-hydroquinone developer (Picker Pix or Ilford) in place of the standard metol-hydroquinone developer.

10. Increasing the kilovoltage from 65 to 90; this increases the relative amount of the penetrating radiation but decreases the milliampere seconds required and therefore reduces the quantity of radiation delivered per exposure. The resulting films will show less contrast than with low kilovoltage technics.

11. Use of high intensity illuminators. Films taken with high kilovoltage on fast emulsions may be more informative if viewed with sufficient light intensities. Sometimes use of a variable rheostat will provide such a wide range of light intensity that darker or lighter films may be read satisfactorily without the need to repeat the examination.

12. Use of a good room plan. Either the space about the dental x-ray machine should be large enough to permit the placement of adequate protective barriers and adequate distance between the operators and the machine, or lead sheets should be attached to the machine itself so that the closer proximity of the operator is not hazardous.

13. Monitoring of the office by a radiation physicist for undesirable radiation. The physicist should measure the approximate skin dosage administered per film. The dentist and his technician should use pocket dosimeters and keep records of the amounts of daily radiation exposure.

14. Utilization of small film cassettes with a cadmium tungstate intensifying screen; this can result in tremendous reductions in roentgen-ray exposure.

The possibility of utilizing electronic image amplification in dental roentgenography is excit-

ing; such technics already are in clinical use in medical fluoroscopes. If a small phosphor could be developed which could be held like a dental mirror in the patient's mouth, the amplified image could be piped to a continuous reel of dental film outside, thus eliminating holding a film in the mouth. The image could be amplified several thousand times in brightness by such apparatus, and readily recorded on fine grain film. This would reduce dental radiation exposure to truly negligible levels; such a future development is possible and highly desirable.

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Radiation output of dental x-ray units

Duane W. Lovett. *J.D.Res.* 38:36-41
Jan.-Feb. 1959

Tests were performed on 14 dental x-ray units in the offices of practicing dentists. The units were produced by four manufacturers, and for testing purposes were grouped according to manufacturer. Four distance settings were made and four exposures made: no. 1 setting was 1 inch; no. 2 setting, 4 inches; no. 3 setting, 10 inches, and no. 4 setting, 17 inches. The approximate tube-target distance for the no. 1 setting was 8 inches; no. 2, 11 inches; no. 3, 17 inches, and no. 4, 24 inches. Each exposure was 10 seconds with a 10 ma. reading and 65 kv. reading on units which recorded kilovolts. Two separate exposures of 10 seconds each were made at each distance setting.

For the three x-ray units in group A, the roentgen outputs at a distance of 1 inch were 26, 26 and 24 r, respectively. The readings at a distance of 4 inches were 17.25, 13.5 and 12.25 r; at a distance of 10 inches, 7.5, 5.5 and 4.5 r; at a distance of 17 inches, 3.75, 3 and 2 r.

The three x-ray units in group B showed a much wider variance of radiation measurements at distances of 1 inch and 4 inches, but approximated the same findings as in group A at the distances of 10 and 17 inches. The seven x-ray units in group C produced low measurements at the distance of 1 inch, but produced measurements in the distances of 10 and 17 inches in a range comparable with those units in groups A and B. The one x-ray unit in group D produced a pattern similar to those units in group C.

Many inconsistencies of the dental x-ray units were noted. Most of the units required that the line voltage meter reading be set from 115 volts to 124 volts to produce a voltage of 110 during operation of the unit. The timers on the units varied from 3 seconds to 6.5 seconds for a 10-second setting. Most of the dentists did not know that their timers were incorrect. Some of the milliamperage meters were not calibrated numerically, so that the operator could not know the exact milliamperage being delivered. Only a few units provided a kilovoltage indicator and control; dentists using x-ray units without this indicator did not know the kilovoltage output of the unit.

Dental x-ray units vary greatly in roentgen output, even when the units are products of the same manufacturer. This variability is sufficient to defeat efforts to standardize dental roentgenographic technics to produce uniform results.

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Microradiographic and radioautographic studies of the hard substances of carious teeth

Gunnar Bergman. *J.dent.Belge* 40:75-85
Jan.-Feb. 1959

The uptake of calcium^{45} and sulfur^{35} in ground sections of carious teeth and the relationship between the uptake and the mineral salt content in these sections were studied in vitro at the department of histopathology of the Royal School of Dentistry, Stockholm, Sweden. Toluidine blue was used in the examinations of the metachromasia of the hard tooth tissues.

Forty freshly extracted deciduous teeth were ground to a thickness of 100 microns without embedding. Microradiographs of the sections were made by Engström and Wegstedt's method (1951). The microradiographs showed the distribution of the mineral salts in the hard tooth structures. After drying in absolute alcohol the sections were placed in neutral solutions containing $Ca^{45}Cl_2$ or $Na_2S^{35}O_4$ for from 10 to 20 hours. After rinsing in distilled water for from one to ten hours with at least ten changes, the sections

were placed on Agfa Printon rapid films for from 6 to 48 hours. The films were processed in a Kodak D 19b developer.

After two months, the radioactivity of the sections treated with S^{35} for the radioautographic examinations appeared too weak to be evaluated in the films. The sections then were placed in the solution containing Ca^{45}, and new radioautographs were made. Thereby it was possible to evaluate and compare the distribution of the two isotopes in hard tooth tissues.

Some of the sections treated with S^{35} were decalcified in 27 per cent ethylenediaminetetraacetic acid (EDTA), and the decalcification process was observed microradiographically. After washing and drying, the sections were placed on photographic films for radioautography, and the more sensitive emulsion (Ilford Ilfex) was used.

The radioautographs revealed a similar uptake of Ca^{45} and S^{35} in the hard tooth structures. The radioautographs indicated an especially high uptake of the isotopes in the cementum, the dentinoenamel junction and the carious areas. In general the dentin showed a lower uptake than the cementum, and the enamel a lower uptake than the dentin.

Comparison between radioautographs and microradiographs revealed that there was an increased uptake of both isotopes not only in the partly decalcified regions of the dentin but also in the deeper parts of carious lesions. In the regions beneath the carious lesions, hypercalcified zones (translucent) appeared in the microradiographs, proving that the uptake of isotopes was extremely low (about the same as in the enamel).

When stained with toluidine blue, the parts of the enamel and dentin which were not affected by caries exhibited a weak metachromasia, changing from blue to pink. Cementum and predentin showed a stronger metachromatic reaction.

The surface parts of carious dentin, where the microradiographs indicated complete decalcification and the radioautographs a strong uptake of Ca^{45} and a lesser uptake of S^{35}, displayed an orthochromatic reaction. The deeper zones with a pronounced uptake of S^{35} remained pale or unstained.

It seems justified to assume that the formation of zones which lost their metachromatic reaction precedes the development of caries, and that, therefore, the deeper zones of carious lesions are formed before the surface zones.

The microradiographs have been evaluated by visual observation. For an accurate determination of the mineral salt content of the hard tooth tissues, however, it will be necessary to make quantitative microphotometric estimations. Such investigations are now in progress, and the results will be published at a later date.

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Dental x-rays for children

J.A.M.A. 170:1248-1249 July 4, 1959

Q.—Is it necessary to roentgenograph the teeth of children who have a routine dental check once a year?

A.—A dental patient should be exposed to the least amount of radiation that will produce the roentgenograms necessary for the evaluation of his oral health. The decision that a practitioner of the healing arts must make is whether the benefits from the roentgenogram outweigh the possibility of potential harm. This is a question of professional judgment, and the well-being of the patient is the paramount issue. Extensive routine roentgenographic surveys seldom are indicated and should be avoided. Special care should be used with children. Only a few exposures are necessary for the child. Pregnant women should not be subjected to extensive roentgenographic exposures.

The foregoing statement also presumes that the exposures are made with a modern dental x-ray machine or with a modernized older x-ray machine, properly filtered and collimated, and that fast films are used and slow developing technics practiced. These precautions greatly reduce the amount of radiation received by the patient. For a clear exposition of the use of x-rays in the healing arts, send 25 cents to the American College of Radiology, 20 N. Wacker Drive, Chicago 6, Ill., or to the order department of the American Dental Association, 222 E. Superior St., Chicago 11, Ill., for the 30-page booklet entitled "A practical manual on the medical and dental use of x-rays with control of radiation hazards."

535 North Dearborn Street, Chicago 10, Ill.

Fractures

Some innovations in the field of jaw fracture

Otto Neuner. *Oral Surg.,Oral Med.& Oral Path.* 12:403-412 April 1959

In the treatment of jaw fractures, functional treatment is preferable to immobilization of the jaws. In the dental clinic of the University of Innsbruck, Austria, methods have been developed which permit excellent functional repair in various kinds of jaw fractures.

Fractures of the horizontal ramus are stabilized with lingual acrylic splints, fixed to the teeth by means of buccal contacted acrylic resin, fortified by a screwable wire arch (Fig. 1). Impressions of both jaws are taken first and cast in hard plaster. The model distorted by the fractured parts then is set into occlusion and fixed, and the splints are made on the model. To insert the appliance, the lingual splint is pressed with the clasp into place. Then the screws are put through the loops of the two arch parts and are tightened slowly. Since the labial arch lined with acrylic resin is closely adherent to the teeth, the fragments are held together like a unit in a vise, and vertical displacement is impossible.

This splint also can be employed for treating alveolar fractures and for immobilizing luxated repositioned teeth, by using a removable tension clamp (Fig. 2) instead of the screw.

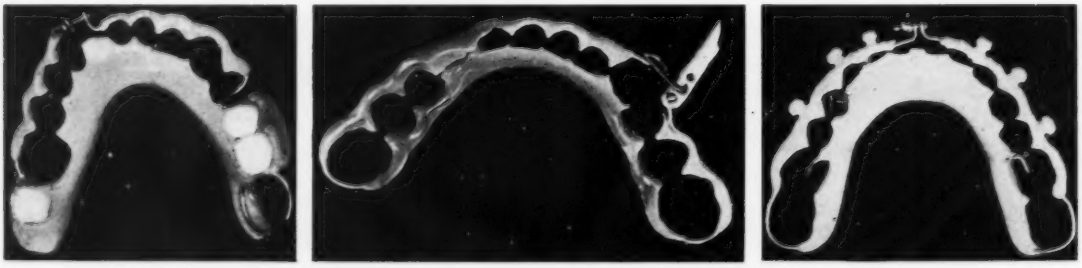
Although the afore-mentioned appliance generally is employed as a functional prosthetic interdental appliance, it also is possible to apply intermaxillary fixation of longer duration with similar splints. In such instances, several acrylic buttons or wire hooks are fixed to the buccal arch (Fig. 3).

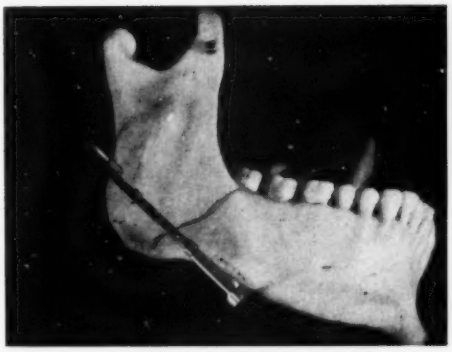
In fractures in the region of the angle of the jaw, if there is no displacement, intermaxillary fixation of the jaw by means of the chin cap often is sufficient. If additional fractures in the tooth-bearing part make the use of a splint necessary, an extension from the splint is established to fix the posterior fragment in position. However, if there is severe dislocation of fragments, the fracture must be reduced by temporary intermaxillary fixation. An extraoral appliance is employed; it is a type of clamp (Fig. 4) with two pointed prongs, the points of which are directed inward. One prong is fixed into a previously drilled hole at the lower edge of the horizontal ramus, and the other prong is fixed into a similar hole drilled in the posterior edge of the ascending ramus. By means of a screw device, the fragments can be pressed together firmly and stabilized in this position. In addition to this intermaxillary fixation, a chin cap bandage may be worn for some time. In addition to this extraoral fixation, a screw clamp (Fig. 5) has been employed with good results. The clamp is set directly from an intraoral ap-

Figure 1 (Left) An acrylic splint used for simple fracture of the mandible

Figure 2 (Center) When equipped with a removable tension clamp, the splint can be removed by the patient for cleaning, and reinserted

Figure 3 (Right) Mandibular splint with buttons for intermaxillary fixation





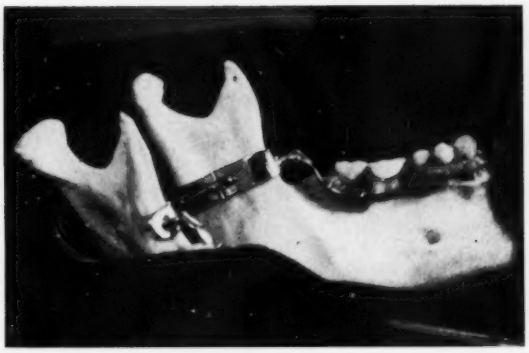


Figure 4 (Left) Extraoral appliance for splinting fractures at the angle of the jaw
Figure 5 (Right) A screw clamp

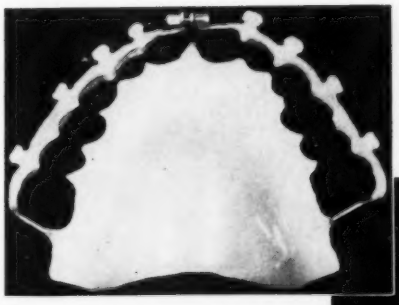


Figure 6 Maxillary splint with buttons

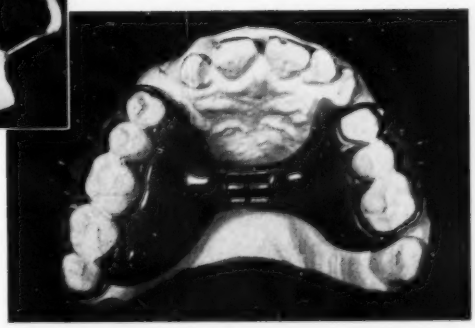


Figure 7 Maxillary splint for treatment of sagittal fractures. Orthodontic screw is in open position

proach to the bone of the ascending ramus and fastened by means of an arch wire to the tooth system or to one of the splints by perforating the mucous membrane.

Alveolar fractures in the upper jaw are treated with splints similar to those described for the mandible, except that the palatal part consists of a plate (Fig. 6). An existing displacement is reduced either by finger pressure or by forcible intercuspidation of the fragments under anesthesia. A split plate provided with a screw, which permits the repositioning of the fragments by orthodontic procedures, may be used.

Sagittal fractures of the maxilla are treated with plates containing a built-in regulating screw between the two parts (Fig. 7). From each plate projects an arch, which encircles the posterior teeth. The arches are made of 0.9 to 1.0 mm. strong hard steel wires, enforced with acrylic resin so as to be well fitted to the buccal surfaces of the respective teeth. Repositioning and retention can be assured by tightening the screw.

For maxillary fractures with lateral or dorsal dislocation, an intermaxillary extension appliance has been used successfully for the repositioning and fixation of fresh fractures as well as for fractures that are partly united in malposition because of delayed treatment.

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Prosthetic dentistry

Complete dentures supported by natural teeth

Paul A. Miller. *J.Pros.Den.* 8:924-928
Nov.-Dec. 1958

The removal of teeth because they interfere with the construction of a dental prosthesis does not promote dentistry as a member of the healing arts. The roots of teeth offer a better medium of support for a denture than does the mucoperiosteum. The fixed partial denture is dentistry's best means of replacing missing teeth.

In nearly every instance where a full mouth extraction is contemplated, two, three or four teeth could be salvaged and restored to a degree of health, to act as supports for the dentures. Even if a short life expectancy of the teeth is anticipated and if their value in preventing resorption is not considered, the assistance they would lend in helping the patient become accustomed to dentures is worth the effort. Pathologic teeth of course should not be retained and used as supports.

Ten years of clinical investigation into the use of isolated teeth as a means of supporting dentures has shown that weak teeth used in this way not only remained in position but, in a number of instances, regained a healthier status. Many teeth which had a poor prognosis outlived their estimated life expectancy for long periods of time. Although such teeth are subjected to greater stress than that for which the root structure and supporting tissues are intended, many are serving successfully as supports for dentures.

In the past six years, 46 dentures have been inserted, under which isolated teeth were used as the principle means of support; 34 were immediate dentures. Evidence of lessened resorption of the ridge tissues in these 46 instances is the fact that the dentures have required no refitting. For immediate denture patients, the denture bearing area opposing the newly surgerized tissues was corrected to keep pace with the healing processes. Most of the 34 immediate dentures were placed in the mouths of patients less than 30 years old.

Generally, the teeth which are to serve as supports for the denture are prepared as if full crown coverage were intended. A shoulder type of preparation is desirable. The shoulder provides space for a labial insert in the thimble portion of the denture and renders unnecessary an oversized lingual surface. The normally flattened occlusal portion of the abutment teeth should be rounded or parabolic in form. Such a preparation permits the stresses of occlusion to be directed along the long axes of the abutment teeth and allows for some movement of the denture. The abutment teeth play no part in the retention of the denture, but act as stabilizers. Frictional retention is undesirable. The denture is retained by interfacial adhesion between the tissue side of the denture and the mucosa.

Twenty-six gauge copings are cast in hard gold to cover the prepared abutment teeth, and are cemented to place. All exposed tooth surfaces should be covered in an effort to prevent future carious lesions from developing. Final impressions are made over the copings.

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Human tooth form and arrangement from the anthropologic approach

Charles H. Moses. *J.Pros.Den.* 9:197-212
March-April 1959

The view prevails in dental teaching that the occluding surfaces of the posterior teeth should retain the same form throughout their lifetime that they had at the time of eruption. If teeth are worn, obliterating the cusps partially or completely, the condition is considered pathogenic, and measures are advocated to restore the teeth to their initial form.

An examination of natural tooth form and arrangement from the anthropologic viewpoint leads to the following conclusions:

1. Wear has been present in human teeth for almost the entire period of human existence. The absence of wear has been manifested only comparatively recently.

2. The angle of wear conforms with the pattern of the chewing cycle.

3. Efficiency is not lost with wear, but an effective chewing mechanism is developed.

4. Several mechanisms have been evolved because of the wear of teeth. In most lower animals whose teeth exhibit considerable wear, a compensatory eruptive mechanism has been developed, sufficient to provide efficient function for the life of the animal. In man, the erupting mechanism need not be as rapid and as vigorous. In man, new tooth substances are not created at the root end. As man's teeth wear down, they continue to erupt and at the same time maintain the line of occlusion. Each human tooth continues to erupt until it meets opposition. As a tooth erupts, bone is proliferated at the gingival crest, so that a healthy tooth in a healthy periodontium rarely leaves its socket.

5. The inclination of a tooth and its unworn occlusal surface follows a natural law which is present in all animals. Under normal conditions a natural posterior tooth inclines in the direction of the ridge opposing it. The occlusal surface inclines toward the opposing contacting occlusal surface.

6. The arrangement of teeth varies in each mouth in accordance with the architecture of the bone which governs the inclination of the teeth. The laws of inclination of teeth should be more widely recognized by orthodontists.

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Muscle activity in denture retention

G. Tryde, S. Schübeler and N. Brill. *Tandlaegebl.* 63:361-366 June 1959

By means of a spring dynamometer, the forces needed to dislodge lower complete dentures were measured in 20 edentulous patients. All patients showed heavy absorption of bone in the denture-bearing area of the mandible. The dentures were provided with brass wire loops in the right and left sides. The arm of the dynamometer was inserted into one of the loops, and a vertical pull was exerted until the denture was dislodged. Five readings were taken in the right and the left sides.

With surface anesthesia, the exteroceptors of the mucosa were inactivated, and the measurements were repeated.

Without anesthesia, the mean force required to dislodge the dentures was 504.60 Gm.; with anesthesia, the mean force required was 181.25 Gm. The difference is highly significant statistically.

Muscles have an appreciable effect on denture retention. Muscle activity transcends in importance all other factors responsible for denture retention, at least in patients in whom the bony foundation of the denture-bearing area of the mandible is heavily absorbed.

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Denture identification

F. M. Lose. *J.Pros.Den.* 8:940-941 Nov.-Dec. 1958

A simple procedure is described for including the patient's name, tooth mold and tooth shade in the denture base material, for identification purposes.

The denture is trial packed and the flask is opened for the last time prior to final closing. The patient's name is typed on a strip of thin paper such as the type of paper that separates the sheets of baseplate wax. The mold number and shade of the teeth then are typed on the piece of paper, which is trimmed to as small a size as possible.

The acrylic resin on the palatal surface between the ridge and the center of the palate is moistened with monomer on a small brush. The strip of typed paper is laid on this surface and the paper is moistened also with monomer. Clear or pink dry polymer is placed over the paper. The polymer is moistened with monomer from a dropper just before the final closure of the flask. The typing will be more legible if clear acrylic resin is used.

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Pedodontics

Somatic and psychologic aspects of fingersucking

Heinz C. Berendt and Aron Brand.
Tschr.tandheelk. 65:707-733
Nov. 1958

An investigation of the dental conditions of 700 Israeli children and of the somatic and psychologic aspects of fingersucking and other sucking habits in these children was carried out at the Dental Institute of the Hebrew University in Jerusalem.

The children were grouped according to their permanent residence: Group I consisted of 350 preschool and school children of an urban area (Jerusalem), and Group II of 350 preschool and school children from various rural areas (communal settlements, called "Kibbutzim").

The incidence of fingersucking (mainly thumbsucking) after the age of six years was significantly higher in Group II than in Group I.

In Group I, the decrease in the incidence of sucking habits was followed by an increase in the incidence of nail biting, especially during the prepuberal period.

In both groups there was no significant difference in the incidence of sucking habits between boys and girls.

The incidence of various tooth anomalies was significantly higher in Group II (more thumbsucking children) than in Group I, but within the groups it was almost equally distributed among children with the sucking habits and those free of these habits.

In both groups, however, the incidence of malocclusion was 25 per cent higher in children with the sucking habits (especially in thumbsucking children) than in those who after the age of six years were free of these habits.

Open bite and a combination of overjet and diastema were common among the thumbsucking children but comparatively rare among children free of sucking habits.

Any increase in duration of the sucking habits was paralleled by an increase in tooth anomalies and malocclusion.

As a psychologic consequence of the sucking habits, nocturnal enuresis (after the age of three years) was observed more often in the children of Group II than in those of Group I.

No relation could be established between the incidence of sucking habits and weight at birth, rank in birth or progress rating at school.

A reverse relationship was observed between the sucking habits (especially thumbsucking) and the duration of breast feeding in both groups. The incidence of fingersucking was particularly common in children who were breast-fed for only three months or less. There was no significant difference in the incidence of fingersucking between children who had received supplementary bottle feeding and those who had received supplementary spoon feeding.

Abnormal fears and anxieties were found at the same frequency in fingersucking and nonfingersucking children. One exception, however, was fear of darkness which was more common in nonfingersucking than in fingersucking children.

No particular personality trait or behavior pattern at school could be correlated with the sucking habits. Of children, characterized at school as being "asocial," a significantly greater proportion had never sucked their fingers.

The findings of the investigation confirm the opinion of many authors that fingersucking exerts an adverse effect on the tooth condition, and promotes dental anomalies which require orthodontic treatment.

Dental Institute of the Hebrew University, Hadassah Medical School, Jerusalem, Israel

The physiologic basis for the clinical management of patients with cerebral palsy

Jerome S. Tobis. *J.Den.Children* 26:132-135
July 1959

The American Academy for Cerebral Palsy has defined cerebral palsy as "any abnormal alteration of movement or motor function arising from

defect, injury or disease of the nervous tissues contained in the cranial cavity." The child or adult with cerebral palsy suffers from multiple handicaps of a sensory, motor or psychological nature.

Cerebral palsy must be considered a chronic disease because of the long-term disability of the patient. Optimal care for the cerebral palsy patient requires the contribution of many medical and other professional specialists working as a team. In the interests of total care of the patient, any professional discipline may be called on to provide less than the maximum of service that is available. If, for example, a cerebral-palsied child required, in addition to many therapeutic procedures, extensive dental care which would interfere completely with all other therapy, it would be wise to permit only limited dental treatment or to provide it over a longer period of time, so that the optimum benefits for this child could be attained.

The three major areas of physiologic activity in rehabilitation are (1) the learning process, (2) motor activity, and (3) growth and development. Total care of the cerebral palsy patient requires an evaluation of (1) his sensory perception, (2) his capacity to organize what he perceives, and (3) his motor function in relation to this sensory organization.

Cerebral palsy is not a static phenomenon but a dynamic process. In rehabilitation the patient must participate actively in order to gain new function. The effective long-range dental care of the patient requires his active participation. The patient must be made to understand, within his capacity to do so, the goals that are sought and the technics that are to be employed in reaching these goals.

The dentist must take into account the disturbances in the learning process that frequently are associated with the brain-damaged patient. Adequate time must be provided for the dentist to explain to the patient the operations which are required and obtain his cooperation in the necessary dental care.

Because cerebral palsy is a motor disturbance of the entire musculoskeletal apparatus, the dentist should not be concerned with one detail in the over-all picture of the disability but must take into account the total consequence of all the factors involved. For example, he should consider occlusion, nutrition, respiration, speech and cosmetic considerations in evaluating the total dental needs of the patient. The dentist must determine the boundaries of function which the patient possesses and must attempt to influence these boundaries so that maximum function can be obtained. The dentist or physician who would attempt to provide the patient with normal function would find the results lead only to frustration. One cannot make the cerebral palsy patient normal. The objective of treatment in cerebral palsy is to influence in a salutary way motor function so that the patient may perform the motor skills necessary to carry on a socially useful life. The dentist should seek to correct this motor imbalance so that maxillofacial function can be improved.

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Intelligence and dental health

G. T. Hutchinson. *Austral. D.J.* 4:31-33 Feb. 1959

The relationship between intelligence and dental health was investigated in 200 children attending the Ainslie Primary School in Canberra. When the children were classified by I.Q. scores, it was found that 32 were in the group of high scores (115+), 74 were in the middle group (score of 91 to 114) and 34 were in the low group (score of 70 to 90).

The gingival condition was scored according to the method of Schour and Massler (1950). Children with high I.Q. scores had a mean P.M.A. score of 14; children in the middle I.Q. group, a P.M.A. score of 20, and children in the low I.Q. group, a P.M.A. score of 23. The mean number of DMF teeth in the three groups were as follows: High I.Q., 7.1; middle I.Q., 9.8, and low I.Q., 9.5. Fifty per cent of the high I.Q. group had good oral hygiene, whereas only 35 per cent of the middle I.Q. group and 10 per cent of the low I.Q. group were so classified.

A trend for the more intelligent children to have higher standards of dental health was noted.

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Orthodontics

Etiology in orthodontic diagnosis

J. A. Salzmann. *Am.J.Orthodont.* 44:867-869 Nov. 1958

The tendency to confuse description of malocclusion (that is, classification by the method of Angle, by roentgenographic cephalometry and by other means) with etiology (the causative factors) still exists among orthodontists. Although cephalometry may localize the malocclusion and indicate where the discrepancy lies, it does not reveal the etiological factors. There is still much to be done and learned before the orthodontist can use with assurance roentgenographic cephalometric analyses, even for descriptive purposes.

Basic etiological factors—for example, poor nutrition, childhood diseases and habits—are not invariably productive of malocclusion. Specific etiological factors are practically unknown as far as malocclusion is concerned; however, there are certain precursors of malocclusion which must be eliminated or at least checked in their early stages if malocclusion is to be prevented or treated successfully.

Serial extraction requires a fine diagnostic sense and wide clinical experience, especially as to whether and when it should be performed. Transitory malocclusion must not be mistaken for patent malocclusion.

Continuing research in electromyography affords the opportunity of detecting muscular disturbances responsible for the manifestation of many types of malocclusion. Until electromyographic testing of the individual patient becomes routine procedure, all talk about muscle balance achieved in treatment is meaningless.

Great strides are being made in bone physiology, and orthodontists would do well to acquaint themselves with the progress made.

The greatest contributions to the knowledge of the etiology of malocclusion may come from research in experimental embryology. Whereas the genotype determines whether a malformation will occur, prenatal and postnatal environment determine the severity with which malformations will manifest themselves.

Although nutritional evaluation of the child about to undergo orthodontic therapy long has been recognized as important, it is largely ignored in practice. Attention to endocrine imbalance frequently is lacking among orthodontists except when the patient shows manifest endocrine deficiency. Yet it is well known that even when endocrine imbalance is not severe, it may influence growth and development adversely.

The "appliance system" approach to the correction of malocclusion will invariably end in failure if basic etiological factors are ignored. Orthodontists should seek the collaboration of workers in related fields and in other sciences in order to enrich orthodontic knowledge.

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The lingual arch as a source of anchorage in Class II treatment: a cephalometric appraisal of forty treated cases

Stanley L. Wein. *Am.J.Orthodont.* 45:32-49 Jan. 1959

Forty patients treated for Class II (Angle) malocclusion by the author were appraised cephalometrically and clinically. In each patient the maxillomandibular relationship was corrected by the use of intermaxillary elastics. A mandibular removable lingual arch was used as the source of anchorage. No teeth were extracted and headcaps were not used.

The average increase experienced in the angulation of the mandibular incisors to the lower border of the mandible in the 40 patients was 2.5 degrees. The range extended from a decrease in angulation of 3 degrees to an increase of 9 degrees.

The average forward movement of the mandibular incisors in relation to the nasion-pogonion reference line was 1.15 mm. The range extended from no change to an increase of 3 mm. Twelve patients showed no forward movement of the

incisors, 12 showed a forward movement of 1 mm. or less, and 11 showed a forward movement of 2 mm. or less. In five patients a procumbency of the mandibular incisors of 3 mm. resulted.

The average forward movement of the mandibular incisors was 1.5 mm. The range extended from no changes to an increase of 4 mm.

The average expansion occurring in the intercuspid width of the mandible was 0.3 mm. In 35 of the 40 patients, expansion of 1 mm. or less in the intercuspid width results. The changes in the arch length of the bicuspid area showed no significant trend because of the presence of deciduous second molars at the outset of treatment in many of the patients.

Five case reports illustrate the cephalometric findings and treatment results.

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Correlations between occlusal pattern, function and pathologic alterations of the masticatory system

U. Posselt and A. Posselt. *Parodontol.,Zürich* 13:3-9 April 1959

The case records and the mounted casts of 865 adult orthodontic patients (327 men and 538 women) with an average age of 35 years were studied at the Royal Dental School of Malmö, Sweden, in an attempt to establish the relations between (1) the occlusal pattern and the function of the teeth, and (2) the occlusal pattern of the teeth and certain pathologic alterations occurring in the mouth, especially in periodontal disease.

The main object of the study consisted of determining the correlations between the degree of vertical and horizontal overlaps, the number of teeth and the Angle's class of malocclusion. Freeway space and condylar shift measurements from the rest position to the retruded position as well as to the intercuspidated position also were taken into consideration.

Measurements of vertical and horizontal overlaps were made on plaster casts by Lundström's method. The shifts of the condyles were measured from the condylar ball positions secured from intraoral records of the retruded and rest positions of the lower jaw.

The findings were summarized as follows:

1. Large vertical overlaps frequently are accompanied by large freeway spaces.

2. Neutral bite, including Angle's Class I, usually is accompanied by an extremely small freeway space.

3. Large horizontal overlaps often are associated with an increased condylar shift when the mandible moves from the rest position to the retruded position.

4. Small horizontal overlaps, including Angle's Class II, divisions 1 and 2, frequently are associated with a decreased condylar shift.

5. Whether any correlation exists between the occlusal pattern of the teeth and pathologic tissue alterations as seen in periodontal disease appears doubtful. The investigation of such a possible relationship between anatomic conditions and the predisposition to periodontal disease, however, is not terminated.

6. Correlations between Angle's Class III malocclusion, periodontal disease and arthrosis of the temporomandibular joint were found only in a few isolated instances.

The number of statistically significant relations between the occlusal pattern, the function and pathologic alterations of the masticatory system definitely established were rather few, particularly because certain interdependent characteristics of anatomic features may assume symptoms which could be taken as evidence for existing relations. To disprove previously accepted concepts of such a correlation, however, has as much value as corroborating the findings.

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Relations between malocclusion and speech defects

Melania Zawardzka-Smolarska. *Czasop.stomat.* 11:333-342 May 1959

Twenty-four patients (12 boys and 12 girls) with malocclusions (Mitrinowicz's classification, Type I and IV, corresponding to Angle's classification, Class II, Division 1 and 2) were studied at the Orthodontic Clinic of the University of Warsaw, to determine whether a relation exists between malocclusion and speech defects (especially lisping), and whether the speech defect can be repaired by orthodontic treatment.

The children, from 5 to 11 years old, underwent an examination of intelligence, hearing and vision prior to the study. Only those who did not show signs of mental retardation or of imperfection in hearing or vision were considered in this study. None of the children was treated by a phoniatrician.

Although final conclusions could not be made because the orthodontic treatment was not completed, on the basis of the present observations it seems that:

1. Speech defects, especially lisping, are associated with malocclusion.

2. Prior to orthodontic treatment, many of the children were unable to pronounce correctly the sibilants "s" and "z."

3. The type of speech defect present does not necessarily correspond to specific classes of malocclusion.

4. In instances of speech defects caused by or associated with malocclusion, orthodontic treatment is beneficial because correction of the malocclusion usually permits normal function of the articulation muscles, especially those of the tongue.

5. Supplementary phoniatric treatment should be initiated early.

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The activator's mode of action

Paul Herren. *Am.J.Orthodont.* 45:512-527 July 1959

The concepts held by earlier authors of the mode of action of the activator are not clear. The activator usually is worn only at night. Robin thought its efficiency was a result of active movements of the mandible as they are produced in masticatory function. Watry recommended the use of the activator for the stimulation, support, guidance and development of functional strengths. He named the muscles of mastication as the sources of power. Functional orthodontics, which later was recommended by Andresen and Häupl, is based on a similar foundation. The passive activator, it is claimed, increases the activity of the masticating muscles. The intermittent movements of the apparatus give the teeth continuous jolts, causing vibration which, in turn, vibrate the periodontal tissues. This vibration stimulates tissue rebuilding. The moving apparatus is the causative factor and the musculature is the source of stimulation. The apparatus itself, not being clamped between the teeth, exerts no pressure. Pressure alone cannot cause orthodontic tissue rebuilding. Such rebuilding requires intermittent action; that is, "many short single impulses."

According to the author, two different principles are found in the activator's mode of action:

1. An effective principle accomplished by addition of all the pressure applications in a certain direction to a determined place of action, per unit of time. This "effective principle" is not equal for all the places and directions of action desired in a patient. It can be influenced only partially by the orthodontist.

2. A sparing principle resulting from intermittent conditions. The activator usually is worn only at night, during sleep; that is, for about a third of a day. For 14 to 16 hours the jaw is free to function, without any hindrance. This is the "big intermittence," favorable to a recovery of periodontal tissue. During the time the apparatus is worn at night, the "little intermittence" also is characteristic; pressure applications are interrupted from time to time by pressure-free or pressure-poor intervals because of the automatic self-guidance. Gubler (1942) assumed that these intermittent conditions are most favorable for the tissue. Because of them, the periodontium never will be exposed to a long-lasting compression and hindrance of blood circulation leading to necrosis and resorption.

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Periodontics

Nutritional aspects of periodontal disease

Dorothea F. Radusch. *Parodontopathies* 15:38-49 July 1958

As an integral part of the human body, the periodontal tissue is influenced by the same nutritional factors that affect other tissues. It has been demonstrated in numerous animal experiments as well as by research on human subjects that nutritional deficiencies are capable of producing or influencing destructive changes in the periodontium.

Except for evident gross deficiencies, the evaluation of a patient's nutritional condition is more or less only an estimate and subject to error. Malnutrition sometimes occurs without any demonstrable abnormal levels in blood and tissues. In testing the individual nutritional condition, the urinary excretion of thiamin is of doubtful value and technics to determine riboflavin deficiency have not been definitely established. No correlation exists between the ascorbic acid level of blood plasma and the presence of gingivitis or scurvy.

The periodontal tissue responds differently to irritating stimuli whether they are systemic, localized or combined. Signs and symptoms, therefore, are not characteristic for a specific stimulus. Until new and more accurate diagnostic test methods are developed to detect incipient nutritional deficiency and gross insufficiency, the general examination of the patient (including complete history, findings of dental, oral and roentgenographic examinations and a diary of the patient's food intake for at least one week) seems to be the only available diagnostic procedure.

At present, research has not furnished adequate data on the exact amounts of minerals, proteins, vitamins, and so forth, required to protect the periodontal tissue and to maintain its health. It is advisable, therefore, to place patients with periodontal disease on a diet which provides optimal nutrition without emphasis on a single nutritional factor.

Comparison of food intake, listed in the weekly diary, with the recommended dietary allowance will furnish some clues as to whether the patient has been consuming foods which provided essential nutrients in sufficient quantity.

Planning and composition of each meal will play an important part in the treatment because today we cannot be satisfied that the recommended daily nutrient intake is above the minimum. Evidence exists that the distribution of certain nutritional factors is as important as the total amount consumed.

If the patient's history and clinically observable changes suggest the possibility of a nutritional deficiency, it is desirable to supplement the recommended diet with standard multivitamin preparations.

The etiology of periodontal disease is complicated by various factors. The diet and nutrition, therefore, should receive more attention as one of the procedures available in the prevention, control and treatment.

From the practical viewpoint, animal experimentations are scarcely of value for the study or treatment of periodontal disease in man.

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Indications for gingivectomy: preoperative and postoperative procedures

Alfredo Isasi Garcia. *Parodontopathies* 15:199-205 July 1958

The indications for gingivectomy must be thoroughly understood, and all possible contraindications should be considered.

Shallow periodontal pockets with soft red and edematous tissue walls indicate treatment by subgingival curettage; pockets with dense fibrotic tissues, even if they are shallow, are treated best by gingivectomy because a prolonged gingival inflammation will not regress to the desired architectural form and tends to leave a deepened gingival sulcus even after seemingly satisfactory healing. Deep periodontal pockets always require gingivectomy because this type of pocket fre-

quently persists after completion of the periodontal treatment.

All indications for gingivectomy should be evaluated properly prior to the operation. Not only should the depth of the pockets be considered but also the pathologic changes occurring in the periodontal membrane, the gingiva and the alveolar bone.

The following factors must be evaluated preoperatively and postoperatively: (1) the findings of clinical and roentgenographic examinations as well as the results of comparative cast model studies; (2) the severity of the pathognomonic symptoms, especially vertical or horizontal atrophy and narrowing of the periodontal spaces; (3) the determination of tooth mobility and of the extent of the destruction within the roots (the prognosis for preserving such teeth is poor), and (4) the selection of the surgical technic best suited for the individual condition. In most instances, Glickman's method of treatment modified by a two-stage operation, one for each dental arch, and followed by the application of gauze packs impregnated by an oxytetracycline hydrochloride solution, obtains the most favorable results.

Preoperative and postoperative medication with prednisone, vitamin E and tripelennamine hydrochloride or its derivatives is recommended.

Postoperative insertion of prosthetic restorations, constructed with consideration given to the condition of the marginal gingiva and to preservation of all stable teeth concludes the treatment.

The hypersensitive cervical region may be treated by topical applications of a 2.2 per cent sodium fluoride solution.

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Periodontal reaction to functional occlusal stress

Sigurd P. Ramfjord and Charles A. Kohler. *J.Periodont.* 30:95-112 April 1959

Periodontal adaptation to a functional increase or decrease in occlusal stress was studied in the labiocervical region and coronal one half of the root of 15 anterior teeth in 14 human subjects. With nine of the experimental teeth all of the teeth of the opposing jaw were extracted in preparation for dentures, thereby leaving the experimental tooth without an antagonist, and decreasing the occlusal stress. With six of the experimental teeth, all the posterior maxillary teeth were extracted, it being assumed that this complete loss of posterior support would increase the functional load on the remaining anterior teeth.

The histological findings were similar in the eight maxillary specimens where the opposing teeth were extracted. In each of these instances, a remodeling of the alveolar process associated with a lingual incisal movement of the teeth could be observed. Apposition of bone appeared at the alveolar crest and along the periodontal membrane surface of the alveolar bone; resorption was evident on the labial aspect of the alveolar process. In the one mandibular tooth without an antagonist, the pattern of changes in the periodontal membrane was as described for the eight maxillary teeth, but there was no evidence of resorption on the labial aspect of the alveolar process.

The periodontal findings in the six specimens with increased occlusal stress varied considerably from those in the nine specimens without antagonists. A process of remodeling of the alveolar process was observed also in the six specimens, but here the remodeling represented an attempt to compensate for a labial movement of the teeth subsequent to the increased labial component of the occlusal stress. Apposition of bone was found on the labial aspect of the alveolar ridge and along the labial surface of the alveolar process. On the periodontal membrane side of the alveolar bone there was evidence of alternating areas of resorption and repair, with the resorption dominating over the new bone formation.

The most stable periodontal structure with regard to functional changes in occlusal stress appears to be the Sharpey's fibers entering the cementum and the periodontal fibers coronally to the margin of the alveolar crest. Most of the adaptation of the periodontal fibers to change in functional demand seemingly takes place at the surface of the alveolar bone and the middle zone of the periodontal membrane. Disuse atrophy of functionally oriented periodontal fibers in adults is a slow process. Loss of posterior teeth may lead to traumatic occlusion with such sequelae as resorption of the surface of the root extending into dentin, and resorption of the alveolar bone with

perforation of the labial wall of the alveolar process. Remodeling and partial rebuilding of the alveolar process in response to changes in functional occlusal stress occurred in all the 14 patients regardless of the variation in age from 16 to 68 years.

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Tooth mobility and alveolar bone resorption as a function of occlusal stress and oral hygiene

Arne Lovdal, Olav Schei, Jens Waerhaug and Arnulf Arno. *Acta odont.scandinav.* 17:61-77 May 1959

In a group of 683 men between 35 and 55 years old, the relationships between increased tooth mobility, alveolar bone resorption, oral hygiene and occlusal stress were evaluated. Of 8,093 teeth, 6,672 were in normal function and 1,421 were "heavily loaded."

The teeth were considered as being subjected to undue occlusal stress when eight or less teeth in each jaw occluded with teeth in the opposite jaw, or when the occlusion and articulation were such that the masticatory forces obviously were taken up by a very small number of teeth. The efficiency of toothbrushing was charted and brought into the analysis.

The statistical evaluation demonstrated that there are significantly more teeth with increased mobility among the "heavily loaded" teeth than among the "normally loaded" teeth. At the same time it was observed that the number of mobile teeth was considerably higher in persons with poor oral hygiene than in those with good oral hygiene.

The relationship between occlusal stress and alveolar bone resorption was studied in 424 men between 35 and 45 years old. A set of ten roentgenograms was taken of each person, and in these the height of the alveolar bone was measured as a percentage of maximum height. Of 5,371 teeth, 4,337 were in normal function and 1,034 were "heavily loaded." No significant difference in the amount of bone loss could be found between the "normally loaded" and "heavily loaded" teeth.

The following conclusions seem justified:

1. Occlusal stress and poor oral hygiene increase the mobility of the teeth, but occlusal stress does not seem to increase the speed of alveolar bone resorption.

2. The presumption that traumatic occlusion is an important etiologic factor in periodontal disease is not substantiated by the present study.

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Periodontal disease and exotic pathology

Jean Claude Harter. *Parodontopathies* 13:270-274 July 1958

Although no natural racial immunity to infectious or parasitic diseases has been demonstrated, a partial immunity to these diseases has been observed in African aborigines, acquired by previous contacts with the pathogenic microorganisms or parasites.

Just as in "domestic" pathologic conditions, instances of periodontal disease resulting from "exotic" pathologic conditions frequently occur in African natives as nonspecific responses of the periodontal tissues to specific local or systemic disturbances.

The common causes are calculus accumulation (promoted by the lack of dental, especially prosthetic, treatment and by the complete absence of oral hygiene), and the habitual chewing of tobacco leaves, betel and kola nuts.

The most common periodontal disease in French Africa is a seasonal gingivitis of an epidemic type, caused by typically tropical factors, especially a diet lacking most of the nutritive elements (proteins, vitamins and minerals).

A variety of this exotic gingivitis is the so-called "acclimatization" gingivitis which is comparatively harmless and shows the attempt at adaptation to different bioclimatic conditions of white people recently arriving in Africa.

Both types of gingivitis are associated with an intestinal parasitosis, either helminthic or amoebic, and are characterized by hyperemia of the gingival margin and ulcerating necrosis.

Histopathologic examination aids the diagnosis by revealing the presence of an increased number

of eosinophilia in the white cell series of the blood and the existence of parasitic species.

Treatment consists in thorough scaling of the teeth, topical application with dental pastes containing salts, local antibiotic therapy (in powder form), prescription of adequate doses of vitamins (ascorbic acid, flavone, eriodictyol and hesperidin), administration of liver extracts and, after identification of the causative parasite, antiparasitic therapy.

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Studies on the etiology of periodontosis: I. The role of vascular changes in the periodontium

D. Vincent Provenza, W. Robert Biddington and Thomas C. Cheng. *Oral Surg.,Oral Med.& Oral Path.* 12:676-684 June 1959

To distinguish between periodontosis and periodontitis is important both to the clinician and the student of histopathology, since the cause and treatment of the two conditions are specific. Periodontosis is a nonexogenically produced inflammatory or noninflammatory histopathologic condition, initiated by the disarrangement of the fibrous elements of the periodontal membrane, followed by the occlusion of the vascular elements which, in turn, initiates the osteoclastic and cementoclastic activities. Periodontitis is a secondary inflammatory condition brought about by the introduction of an exogenic etiological agent, such as calculus or bacteria. The specific degree of periodontosis is an important factor in the introduction of periodontitis, since periodontitis is initiated mainly in the third stage of periodontosis.

Histologic investigation of oral tissue from a patient with third-stage periodontosis suggests that the disarranged fibrous elements of the periodontium are responsible for the partial or complete occlusion of the blood vessels within the region; in turn, this occlusion is responsible for the initiation of osteoclastic and cementoclastic activities.

Definitions of "periodontosis" and "periodontitis" as proposed by the 1949 nomenclature committee of the American Academy of Periodontology are not in complete accord with the earlier meanings attributed to the two terms, as set forth in the first paragraph. The earlier definitions are more specific and more logical from the standpoint of histopathology, and therefore should be preferred.

The authors currently are investigating the hypothesis that the resorption of bone and cementum may be the immediate result of alkaline phosphatase or an alkaline phosphataselike enzyme secreted by the osteoclasts and cementoclasts, which are degenerating.

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Effects of aloe extract in the treatment of periodontosis

Zbigniew Janczuk. *Czas.stomat.* 12:71-78 Jan. 1959

The effects of "Biostimin," a tissue extract from the leaves of *Aloe vera,* in the treatment of periodontosis were studied in 44 patients at the clinic of the Dental School of the University of Lodz, Poland.

A dose of 1 ml. Biostimin daily was injected intraorally for 35 consecutive days. At the same time all calculus accumulations were eliminated, the occlusion equilibrated and all loose teeth stabilized by splinting.

Clinical check-ups after 2, 3 and 12 months revealed that in 62.03 per cent of the patients, the masticatory function was improved, the periodontal membrane was firm and pink, and the degeneration of the connective tissue elements of the periodontium as well as the bone resorption were arrested. Symptoms such as pain, hemorrhage, inflammation, swelling, hyperemia and purulent effusion had disappeared. Tooth mobility was reduced by about 50 per cent. All patients reported a decrease in the subjective symptoms and a feeling of improved general health.

In another group of 21 patients with periodontosis, a placental extract was used. The clinical and roentgenographic results were similar.

Both aloe extract and placental extract have proved to be valuable drugs in the treatment of initial and advanced forms of periodontosis.

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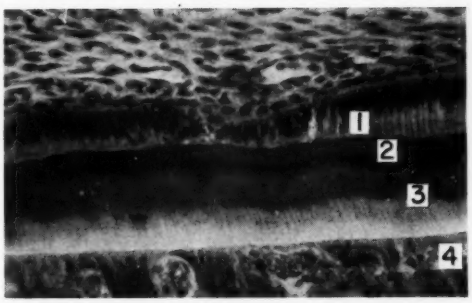

Figure 1 Section of developing mandibular incisor of young rat of mother subjected to hypoxia. 1, ameloblast layer with area of disoriented, pyknotic and morphologically altered cells in center; 2, enamel matrix; 3, dentin matrix; 4, odontoblast layer

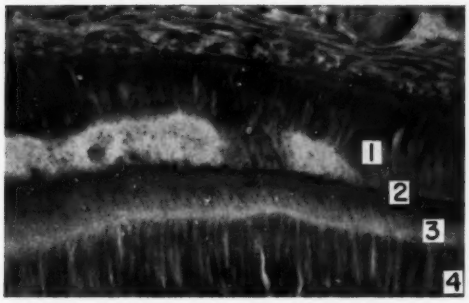

Figure 2 Section of developing maxillary incisor of young rat of mother subjected to hypoxia, demonstrating a cystoid disturbance of ameloblast layer. 1, normal ameloblasts with cystoid area to left; 2, dentinoenamel junction; 3, dentin matrix; 4, odontoblast layer

Biochemistry

The effect of maternal hypoxia upon fetal dental enamel

William F. Via, Jr., William K. Elwood and Jose Bebin. *Henry Ford Hosp.M.Bul.* 7:94-101 June 1959

The present study was designed to determine whether hypoxia of pregnant rats will produce disturbances of amelogenesis in their young. Fifteen rats were separated into experimental and control groups. Four experimental rats were subjected to hypoxia on the tenth postbreeding day, three on the fifteenth postbreeding day and three on the twentieth postbreeding day. The five control animals were not subjected to hypoxia.

One rat in each group delivered her young. The other rats were anesthetized and the young delivered by cesarean section. The young were decapitated, and the heads were prepared for histologic study.

The 10 rats in the experimental group delivered 91 living young. Three of the young were dead at birth. The 5 rats in the control group had 42 young, 2 of which were stillborn. None of the young had cleft palates or other gross abnormalities.

No enamel, brain or eye defects were found in the young of any of the control animals or in the young of any of the experimental animals subjected to hypoxia on the tenth or the fifteenth postbreeding day. Seven young rats of mothers treated on the twentieth postbreeding day had ocular damage. Four young rats of these same mothers had disturbances of amelogenesis. The ameloblastic defects were bilateral in two young rats; only one incisor was abnormal in each of the other kits. The defects ranged in width from 60 to 350 microns. In each instance, the damage was located near the site at which the deposition of enamel matrix begins. The severity of the observed ameloblastic defects ranged from a disorientation and morphologic alteration of ameloblasts (Fig. 1) to the formation of cystoid areas and development of an abnormal enamel matrix (Fig. 2).

The disturbances of amelogenesis were found in only one of the litters in the group. This may be explained on the basis of the time when ameloblasts are most sensitive to attack. Tondrey (1956) reports the ameloblasts are more easily affected during the appositional stage than at earlier stages. The twentieth day of gestation

(the day on which the mother rats were subjected to hypoxia) coincides with the beginning of apposition of enamel matrix on the rat incisor. The litter with dental defects was born 12 hours before the twenty-second day when the experiment was terminated with the death of all experimental and control animals. The other two litters of the mothers in this group were delivered by cesarean section on the twenty-second day. It is possible, therefore, that enamel matrix formation was progressing at the time the experimental conditions were imposed in the litter exhibiting defects and had not started in other litters.

These experiments do not demonstrate that any of the observed effects on the developing fetuses were direct responses of the ameloblasts to hypoxia. Indirect factors—such as alteration of the acid-base balance and circulatory disturbances—may occur secondarily to oxygen deficiency in both the mother and the developing young. The ameloblastic damage observed in this experiment was either a direct response of ameloblasts to hypoxia or was caused by alterations of metabolism resulting from hypoxia. Additional research into the response of dental tissues to hypoxia is in progress.

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Drinking lemon juice

J.A.M.A. 170:1252 July 4, 1959

Q.—Is it advisable to drink the juice of a lemon daily?

A.—According to Stafne and Lovestedt (1947), the use of lemon juice as a daily drink in any appreciable concentration should be discouraged. These authors reported that in a series of 50 patients who used lemon juice continually there was evidence of dissolution of dental structure. Although the daily use of lemon juice has been advocated by many persons, an adequate amount of vitamin C can be received without resorting to the improper use of lemon juice, in view of its solvent effect on the teeth.

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Endogenous respiration of human gingival tissue

Alvin D. Senter, John J. Eiler and K.-H Lee. *Proc.Soc.Exper.Biol.& Med.* 100:323-324 Feb. 1959

In the absence of pronounced anaerobic metabolism, it may be assumed that the rate of oxygen consumption is a reasonable index of the biochemical activity of a tissue. The value of 1.6 for endogenous QO_2 (oxygen uptake) of human gingival tissue (dry weight) reported by Glickman and others (1949) appears to be low for a tissue which grows fast and heals rapidly. Laser (1942) has shown that the QO_2 of tissue in the absence of added substrate decreases rapidly with time. A time-dependent decrease in respiration, together with delay in starting respiration trials, could well account for the low values previously obtained. To test such an explanation, the authors used a modified Stern-Kirk microrespirometer and low incubation temperature to study the time-dependence of endogenous respiration.

Studies were made on biopsy samples of gingival tissue from 19 persons ranging in age from 9 to 69 years. The rate of endogenous oxygen uptake of gingival tissue was determined at successive ten minute intervals for one hour. The average QO_2 calculated on the basis of the first ten minutes would amount to 14.1, whereas the calculated value for the last ten minutes would be 8.1. The rate of endogenous respiration of human gingival tissue is clearly dependent on time. However, reasonably high values may be obtained if speed and low temperatures are used in the preparation of the slices.

The pronounced time-dependence of the rate of endogenous respiration of human gingival tissue points out the need to control rigidly the conditions under which respiratory trials are made. Undoubtedly, reliable and reproducible values would be obtained if the determinations were carried out in the presence of added substrate and in the presence of carbon dioxide.

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Bacteriology

Changes in the human oral flora after administration of antibiotics (penicillin, chlortetracycline and oxytetracycline)

F. Patočka, M. Pohunek, A. Zedniková and M. Skružná. *Časop.lék.česk.* 48:358-364 March 20, 1959

The quantitive and qualitative changes in the bacterial content of the oral cavity occurring after administration of three antibiotics produced in Czechoslovakia—penicillin, chlortetracycline (Aureomycin) and oxytetracycline (Terramycin)—were studied at the Institute of Epidemiology and Immunology of the University of Prague.

The enumeration of bacteria was based on the direct count, the viable count and the correlation of both counts with the turbidity of the bacterial suspension, measured by photoelectric calorimetry.

Penicillin produced no significant change in the oral flora. Chlortetracycline and oxytetracycline, however, caused a significant reduction or a complete disappearance of some of the bacterial species simultaneously with an increased growth of unphysiologic microorganisms, especially *Candida albicans* and *Proteus vulgaris*. Predominance of *C. albicans* may cause infections such as thrush or other forms of moniliasis; predominance of *P. vulgaris* a variety of pathologic conditions such as pleuritis, peritonitis, cystitis and suppurative abscesses.

The following conclusions were reached:

1. The three antibiotics should be administered only after an exact diagnosis has been made revealing a definite indication.

2. Chlortetracycline or oxytetracycline should be used only after sensitivity tests have been made.

3. The use of these and other antibiotics should be combined with the administration of folic acid, vitamins K and B or dried yeast.

4. The antibiotic that is likely to cause the least severe reaction should be used. According to the results of this study it is penicillin.

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A study of 225 strains of Staphylococcus isolated from the mouth

Jennifer Taplin and N. E. Goldsworthy. *Australian J.Exper.Biol.& M.Sc.* 36:289-304 Aug. 1958

Two hundred and twenty-five strains of *Staphylococcus* were isolated from the mouths of 130 healthy children aged 4 to 11 years; 65 of the children lived in a children's home in Bowral, New South Wales, and 65 were from a large metropolitan school. The strains were classified (1) on the basis of a series of physiological reactions as set out in Bergey's *Manual of Determinative Bacteriology* (1948) and (2) according to the scheme suggested by Shaw, Stitt and Cowan (1951).

The majority of strains (85 per cent) were gram-positive cocci occurring on solid media in irregular bunches, but in liquid media as single cells, cell pairs, small groups (about six) of cells or arranged in short chains (rarely more than five cells). These cocci appeared to produce hemolysis on a high-salt sheep-blood agar; produced catalase, hydrogen sulfide and methylene blue reductase; fermented glucose, lactose, sucrose and glycerol; reacted to the methyl red test and were sensitive to penicillin; failed to produce indole, to ferment raffinose, starch, salicin, inulin and to grow on a synthetic medium containing ammonium phosphate as the sole source of nitrogen.

The results of the study confirm the generally acknowledged variability of the biological characteristics of staphylococci and the difficulties in determining satisfactory criteria for the establishment of species.

Of the 225 strains studied, 79 were coagulase producers and were therefore regarded as pathogenic to man. Among the 79 pathogenic strains, 15 were resistant to penicillin.

Phage typing failed to demonstrate any predominant strain.

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Histology

Bands of Schreger

J. G. de Boer and G. Stiebeling. *Tschr.tandheelk.* 66:180-189 March 1959

In his *The Natural History of the Human Teeth* (London, 1771), John Hunter wrote: "The Enamel, called likewise the vitreous, or cortical part, is found only upon the body of the Tooth, and is there laid all around, on the outside of the bony, or internal substance. It is by far the hardest part of our body; insomuch that the hardest and sharpest saw will scarce make an impression upon it, and we are obliged to use a file in dividing or cutting it. When it is broken it appears fibrous or striated; and all the fibres or striae are directed from the circumference to the center of the Tooth."

About the mineral part of the enamel, Hunter wrote: "It [the enamel] is a calcareous earth, probably dissolved in the juices of our body, and thrown out from these parts which act here as a gland. . . . This accounts for the striated crystallized appearance which the Enamel has when broken, and also for the direction of these striae."

The following caption accompanies his Plate XIV, Fig. XXIII (Fig. 1): "The Basis of *Molaris* broken through, shewing that the Enamel is striated in this view also, and that all the *Striae* point to the centre. N.B. The Teeth must be broken to shew these facts."

Although Hunter was acquainted with the technic of filing teeth for examining purposes, he stated emphatically that the "striae" can be seen only when the teeth are "broken." When furthermore he described these "striae" as fibrous, it must be assumed that he observed them in transverse fractures. Without any doubt, Hunter did not describe the bands of Schreger but the "crystallized appearance of the enamel when broken."

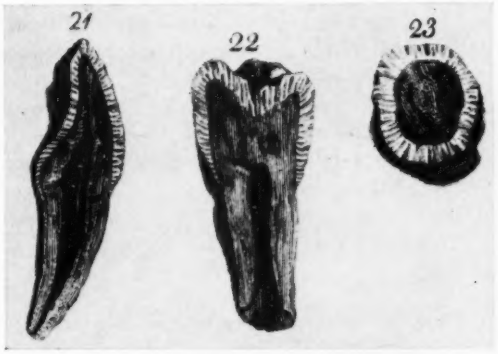
As obvious as it is that Hunter did not describe the bands of Schreger, it is as certain that Bernard Gottlob Schreger, German anatomist (1766–1825) observed and described "a series of bands, visible by reflected light, in the enamel of longitudinal sections of human teeth" in the text as well as in the illustrations (Fig. 2) of his work *Beitrag zur Geschichte der Zähne: Beiträge für die Zergliederungskunst* (Leipzig, 1800). Hunter's name, therefore, should no longer be connected with Schreger's in designating these bands.

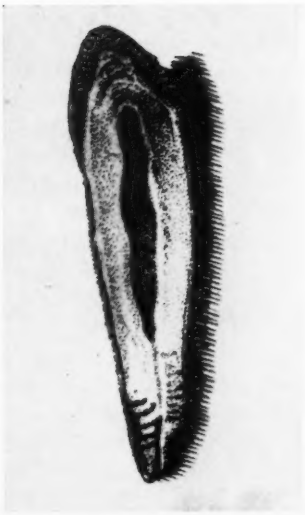
Most authors agree that the bands of Schreger are an optical phenomenon, caused by the fact that enamel rods run in different directions, revealing in successive transverse layers a deviation alternately to the right and to the left side. The bands of Schreger as well as the enamel rods, however, occasionally can be observed in longitudinal axial sections as running crosswise (Fig. 3). In the same specimen (Fig. 4) several bands of Schreger show a sharp curvature, the deeper part and the more peripheral part forming an angle of about 90 degrees. The relation between the bands of Schreger and the enamel rods (Fig. 5) is shown diagrammatically. The optical phenomenon of the bands of Schreger can be accounted for by the transverse undulating course of the enamel prisms (Fig. 6), representing a section at right angles to Figure 5. By comparing Figures 5 and 6, it can be readily observed that under reflected light, at point O, dark bands appear although illumination, at point W, shows a reversal in direction of these bands. The bands which originally appeared dark are light, whereas those which were light are dark. Under reflected light, from point N of point Z, the bands of Schreger can hardly be observed because the enamel prisms are illuminated evenly over their entire length.

Based on these observations it can be concluded that in instances in which the bands of Schreger and the enamel rods run crosswise, a

Figure 1 (Left) Hunter's illustrations of enamel striae in incisors (21), bicuspids (22) and molars (23)

Figure 2 (Right) Schreger's illustration of "bands," later termed bands of Schreger





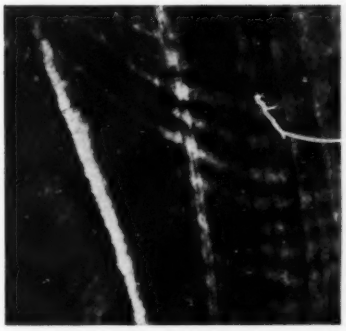
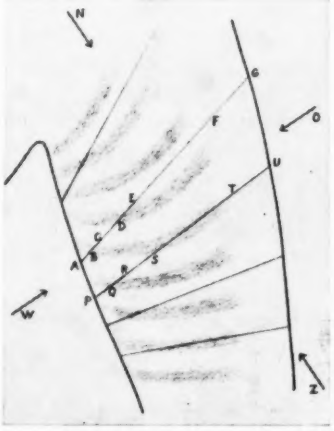


Figure 3 (Left) Bands of Schreger and enamel rods running crosswise (under transmitted light)

Figure 4 (Right) Curvature of the bands of Schreger (under oblique reflected light)



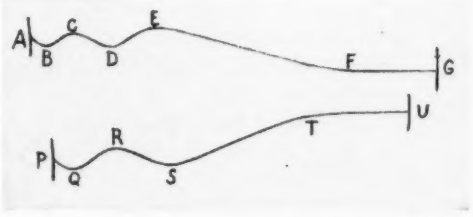


Figure 5 (Left) Relation between the bands of Schreger and the enamel rods

Figure 6 (Right) Transverse undulating course of enamel prisms

greater number of narrower bands become visible under transmitted light than under oblique reflected light. This will be substantiated by comparing Figure 3 (transmitted light) with Figure 4 (oblique reflected light).

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Electronmicroscopic studies of normal human alveolar bones

R. Frank, G. Lindemann and J. Vedrine
Rev.franç.odontostomat. 5:1507-1516 Dec. 1958

Thin sections of normal human alveolar bone were studied under the electronmicroscope by a team, consisting of staff members of the Dental Institute of the University of Strasbourg, France, and of the Royal Dental College of Copenhagen, Denmark. A Serval-Potter microtome was used for cutting the thin slices of bone tissue required for the study. Some of the tissue specimens were decalcified and the others were not.

As fixation medium, the salts (osmates) of osmic acid were used. The osseous specimens were decalcified with a solution of the trisodium salts of ethylene diamine tetra-acetic acid and embedded in n-butyl-methacrylate.

Under the electronmicroscope, the normal human alveolar bone appears to be composed of lamellated osseous tissue which shows a characteristic longitudinal arrangement of the collagenous fibers in the form of arched or featherlike bundles. These fiber arrangements are either irregular or almost parallel.

The collagenous fibers of the periodontal membrane enter the alveolar bone either in the form of Sharpey's fibers which usually are not calcified or in the form of soft, white and flexible fibers which contribute to the formation of the collagenous matrix of the alveolar bone. These collagenous fibers are impregnated with bone salts.

A less calcified zone of the alveolar bone, adjacent to the periodontal membrane, appears to be in the middle stage of differentiation, and may be called a "preosseous" zone.

The membranes of the nucleated cells occupying separate lacunae in the alveolar bone extend deeply into the anastomotic canaliculi. In structure, these bone cell membranes resemble an interlocking tapestry.

The inorganic parts of the alveolar bone were studied simultaneously by electronmicroscopy and electrondiffraction. They show a diffraction pattern similar to that of hydroxyapatite. The long axes of crystals are parallel to the collagenous fibers.

In this study it was possible to observe the shape and size of the crystals, their relation to the submicroscopic organic substances and the orientation of the crystals within the prisms.

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The relationship between the direction of Sharpey's fibers and the deposition of cementum

Anna-Greta Gustafson and Per-Allan Persson.
Odont.Tskr. 65:457-463 Oct. 1957

Several authors have expressed the opinion that the cementum, or more particularly the acellular cementum, is deposited rhythmically. This view has been based mainly on the fact that the different layers of cementum are of approximately the same thickness. It is known that the Sharpey's fibers within the cementum vary in direction in the different layers. These directional changes generally are considered to be caused by changes in tooth position due to functional stress.

In this study, the polarizing microscope was used to investigate the course of the Sharpey's fibers in cementum and bone, and the changes in direction of the fibers have been related to the deposition of the cementum and bone. Sharpey's fibers, by virtue of their submicroscopic structure, have the property of birefringence; this can be revealed if they are examined in a polarizing microscope between crossed Nicol prisms.

Virtually all cementum contains Sharpey's fibers or their remains. Even thick cellular cementum contains fibers in each layer with more or less pronounced changes in direction of the fibers between the different layers. Sharpey's fibers always emerge from cementum and bone in a straight line without directional changes. Stresses and strains thus are applied in the long

axis of the fiber, and it seems likely that only momentary bending of the fiber can occur without damaging it.

The passage of the fiber in a straight line through the outer layers of cementum and through the periodontal space into the outer layers of bone thus would appear to be essential for function. Any permanent change in tooth position will cause the fiber to bend at its points of entry into both the bone and the cementum. To re-establish the former conditions, the fiber must become imbedded anew; as far as cementum and bone are concerned, this can be brought about only by the deposition of fresh layers of bone and cementum outside the old. These new layers presumably are always of about the same thickness, as approximately the same support for the fiber will be required each time. These deposits of similar thickness may give the impression of rhythmic deposition of cement and bone, but it seems likely that the different layers are not due to this.

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Effect of sodium fluoride on the distribution of sulfur ^{35} in rodent teeth

J. S. Kennedy and G. D. C. Kennedy. *J.dent.Belge* 40:63-67 Jan.-Feb. 1959

Schour and Smith (1934) described the histologic changes in enamel and dentin of rat incisors observed after injections of toxic doses of sodium fluoride. Irving and Weinmann (1948) analyzed the phenomenon and termed it the "calciotraumatic response."

In a recent study, sulfur ^{35} was administered in an inorganic form to 26 rats to determine, by radioautographic evaluation and by histochemical staining, the distribution of the radioactive material in the hard tooth structures and to establish the role sulfate mucopolysaccharides play in the mechanism of calcification in the enamel and dentin.

The rats were divided into three groups:

Group 1 consisted of 1 adult and 12 young rats; Group 2 of 2 adult and 11 young rats, and Group 3 of 9 young rats.

In Group 1, the distribution of S^{35} was observed and evaluated from 5 to 169 hours after sodium fluoride injection. The calciotraumatic response in the hard tooth tissues, especially in the dentin, was recognized after toluidine blue stainings.

In Group 2, from 2 to 9 injections of sodium fluoride were made at intervals of from 1 to 20 days. S^{35} was injected 24 hours after each sodium fluoride injection. Multiple lesions were found in the dentin, localized in the hypercalcified zones. Metachromasia was not always observed. No trace of S^{35} could be detected in the hypocalcified regions. Occasionally a slight uptake of S^{35} was observable in the regions where the calciotraumatic response occurred.

In Group 3, single injections of sodium fluoride were given to four young rats, and S^{35} was injected before, after and simultaneously with the sodium fluoride injections. Single sodium fluoride injections were also given to additional five young rats, but in these animals, S^{35} was injected only before and simultaneously with the sodium fluoride injection. The distribution of S^{35} appeared to be inhibited not only in the dentin but also in other structures such as the muciparous glands of the tongue and palate, the mast cells of the skin and tongue, and the cartilage cells.

Group 1 showed normal distribution of S^{35}; Group 2 a chronic toxic fluorosis, and Group 3 an acute toxic fluorosis.

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Physiology

The sense of taste and its disturbances

Th. Port. *Bl.Zahnhk., Zürich* 19:164-167
Dec. 1958

Aristotle (384-322 B.C.) distinguished five senses: sight, hearing, smell, taste and touch. The quality, intensity and duration of taste and smell differ from that of the other senses. Sight, hearing and touch sensations are produced by physical stimuli; taste and smell sensations by chemical stimuli.

Although the olfactory and tactual components contribute greatly to the perceptive sensitivity, the direct receptors of taste provide additional qualities, thereby enhancing the enjoyment of food.

Taste solutions used in investigating the sensitivity of the tongue stimulate the sensation of taste and arouse specific qualities of smell, pressure and temperature. Only four basic qualities of taste can be distinguished by the tongue: sweet, saline, sour and bitter. Most taste sensations, however, are combinations of these basic qualities.

The receptors of taste are the taste buds, collections of cylindric taste cells assembled with sustentacular cells in the epithelial linings of the tongue and the membranous walls of the posterior pharynx. These taste buds are supplied by the fifth and ninth cranial nerves. Each taste bud has a small orifice, the taste pore, through which minute particles of taste solutions are received. Stimulation is chemical, by the action of ions and molecules in food particles on the specific chemicals stored in the taste cells.

During prolonged stimulation, the taste receptors suffer a decrease in sensitivity. As soon as the period of taste stimulation is concluded, gradual recovery occurs. The greater the taste sensation of the solution, the longer is the recovery time.

Disturbances of the gustatory system usually are produced by diseases of the pharynx or by neoplasms of the tongue. Rhinitis and disorders of the paranasal sinuses may lead to parageusia. In pernicious anemia, chronic glossitis and xerostomia, severe disturbances of the taste sense occur produced by atrophy of nerve fibers and a decrease in the reaction of the taste buds to stimuli.

Toward the end of pregnancy, the sensitivity of taste decreases, leading to poor or perverted appetite.

The decrease in the taste quality and quantity in senescent persons has been investigated. Although in these persons most nerve fibers responded adequately to acid solutions, most fibers did not respond to sugar or salt solutions. It can be assumed that the aging of nerve fibers produces a different pattern of nerve activities in the gustatory system of persons older than 45 years.

Treatment of disturbances of the sense of taste belongs to the field of medicine; the dentist, however, should be informed about the cause and effect of these disturbances because usually he will be consulted first by the complaining patients.

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On the composition of human parotid resting saliva and reflex saliva

Rokuro Suhara and Hiroshi Asakawa.
J.Nihon Univ.School Den. 1:153-157
March 1959 [in English]

Saliva secreted with no outside stimulation is termed "resting saliva." Saliva elicited with an outside stimulant is termed "reflex saliva." Of a large number of subjects tested, about 50 per cent produce less than 10 mm. of resting saliva in three minutes; about 35 per cent produce from 10 mm. to 50 mm., and about 15 per cent produce more than 50 mm. Although there is no daily change in the quantity of saliva secreted by one person, there is a seasonal influence; more saliva tends to be produced in winter and less in summer. The quantity of resting saliva produced by the right and left parotid glands is generally the same. A person who produces a large quantity

of resting saliva will not necessarily produce a large quantity of reflex saliva. There is no seasonal variation in the production of reflex saliva.

In the present study, the physicochemical differences between resting saliva and reflex saliva from dental students ranging in age from 20 to 25 years were investigated, with the following findings:

1. The average specific gravity of resting saliva, as measured with the Ostwald picnometer, is 1.0023; of reflex saliva induced by depositing 1.0 cc. of tartaric acid solution on the tongue, 1.0008; of reflex saliva induced by eating pickled plums, 1.0003.

2. Resting saliva has a higher viscosity than reflex saliva induced by tartaric acid or pickled plums.

3. The surface tension of reflex saliva is greater than that of resting saliva.

4. The pH of resting saliva ranged from 5.8 to 6.8; that of reflex saliva induced by tartaric acid, 7.2 to 8.8; that of reflex saliva induced by pickled plums, 8.2 to 9.0. Reflex saliva induced by looking at other persons eating pickled plums has a pH ranging from 6.6 to 7.6.

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Mandibular positions and mandibular movements: a review

Niels Brill, G. A. Lammie, John Osborne and Harold T. Perry. *Brit.D.J.* 106:391-400 June 16, 1959

A new nomenclature of basic mandibular positions is proposed, based on recent researches in this subject.

The head may be regarded as having three planes of reference: sagittal, coronal and horizontal. Viewed in the sagittal plane, which is most revealing, the mandible has vertical and horizontal axes of reference.

In the proposed definitions that follow, the synonyms used in dental literature are enclosed in parentheses.

There are two basic vertical positions of the mandible in the sagittal plane:

1. Rest position (postural position, endogenous postural position) is that vertical postural position of the mandible governed by muscle tonus.

2. Tooth position (maximally intercuspidated position, maximally interdigitated position, cuspal position, or centric position) is that vertical and horizontal position of the mandible in which the cusps of the mandibular and maxillary teeth intercuspidate maximally.

Three horizontal positions of the mandible in the sagittal plane are defined:

1. Ligamentous position (centric relation, centric position, retruded position, or hinge position) is that horizontal position of the mandible when further posterior displacement is restricted by both lateral ligaments of the temporomandibular joint.

2. Muscular position (centric position) is that horizontal contact position of the mandible defined by the reflex muscle pattern acting as the mandible closes from the rest position.

3. Tooth position (maximally intercuspidated position, maximally interdigitated position, cuspal position, or centric position) is that vertical and horizontal position of the mandible in which the cusps of the mandibular and maxillary teeth intercuspidate maximally.

The whole emphasis in a study of mandibular movements must be on function. Functional mandibular movements may be divided into (1) masticatory movements, (2) swallowing movements and (3) empty movements. The pattern of mastication varies with the particular type of food being chewed; this applies more to the physical characteristics of the food—liquid or semisolid, solid food which is comminuted by heavy masticatory force, or solid food which flows or is comminuted by light masticatory force—than to the particular article of diet.

Two types of swallowing movement may be differentiated. In one, the opposing teeth do not make an occlusal contact, whereas in the other they do. Empty movements comprise all occlusions other than those taking place in mastication or swallowing. They may be observed in some conditions of mental stress and in some instances of periodontal disease.

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Pathology

Oral sepsis

O. V. Petrova. *Abstr.Soviet Med.* 3:130
Jan. 1959 [in English]

The question of oral infection and its role in the appearance of the septic state in the body was studied experimentally in dogs, in whom periodontal granulomas and cysts were induced and the histogenesis of their cellular elements investigated. Introduction of streptococcal cultures into the dental pulp led to acute pulpitis and then to periodontitis.

In the next series of experiments, a preliminary nonspecific allergic state was created in the animals by injection of normal horse serum. Streptococci then were introduced. The inflammatory process in these dogs was more intense and always diffuse; microscopic changes in the focus were investigated, as were changes in the tissues of the liver, kidney and myocardium. Focal osteomyelitic processes developed in the jaw. Degenerative and inflammatory changes corresponding to morphological disorders associated with sepsis were found in the internal organs. The myocardium showed cloudy swelling of the fibers; the interstitial tissue showed diffuse capillary inflammation. Pronounced changes were seen in the liver, including tissue hyperemia and some disorganization of the hepatic trabeculae, with granular degeneration of the liver cells. Predominantly perivascular infiltration and perivascular edema were seen in the interstitial tissue. In the kidneys, cloudy swelling of the tubular epithelium was observed, with much infiltration of small cells in the interstitial tissue; endothelial proliferation was seen in the glomeruli.

The data suggest that inflammatory foci in the teeth can be grouped with the other, established, septic foci.

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Behçet's syndrome

E. Schulze. *Deut.med.Wschr.* 83:469-470
March 21, 1958

What is now known under the term "Behçet's syndrome," recurrent ulcerations of the genitals, aphthous lesions of the oral cavity, a grave form of uveitis or iridocyclitis followed by hypopyon, was known in antiquity. In some instances, Behçet's syndrome is complicated by involvement of the skin and the central nervous system.

Although Behçet (1889–1948) speculated that the syndrome might be caused by a certain virus, the virus etiology has been definitely demonstrated during the last few years.

The syndrome may develop at any age; the majority of instances, however, occur in adolescents and more frequently in girls than in boys. It has been attributed to virus infection during menstruation causing glandular disturbances. The possibility of its being an allergic manifestation has been advanced: an instance in which the patient was increasingly sensitive to milk and milk products has been reported.

The oral lesions that occur in the early stages are a result of intraepithelial edema in the stratum granulosum of the mucous membrane. Later, comparatively large ulcers are formed with a surrounding inflammatory reaction. At that stage, the lesions are extremely painful and cover the mucosa with a yellowish white slough at the buccal and lingual aspects and the tip and the sides of the tongue. The lesions seldom occur in the alveolar region. The ulcers heal and recur at irregular intervals.

Every effort should be made to discover and treat the causative factors although it will be difficult, in most instances, to determine these with certainty. Cooperation between dentist and physician is necessary. The diet recommended should be rich in vitamins (vitamin B complex and C). Antihistamine treatment may obtain temporary improvement.

With the great possibility that the syndrome is caused by a viral allergy, influenza viral vaccine may be used.

Attention should be paid to strict oral hygiene and a mild astringent mouthwash be prescribed.

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Nicotine stomatitis of the palate

William H. Saunders. *Ann.Otol.,Rhin.&Laryng.* 47:618-627 Sept. 1958

It is well documented that tobacco smoke causes lesions in the hard palate. Dental pathologists and oral surgeons sometimes refer to such lesions as "nicotine stomatitis" or "papular leukoplakia." Mild degrees of nicotine stomatitis frequently are seen in patients; advanced stages of the disease usually are not overlooked but often are misdiagnosed.

In the oral cavity, nicotine and its combustion products produce pathologic changes chiefly in the hard palate. Tobacco smoke probably strikes the palate more directly than it strikes other parts of the oral cavity. Also, the hard palate may be especially sensitive to tobacco smoke.

When a bright light is used to examine the normal palate, tiny orifices of mucous glands are visible. These normal duct orifices are seen as small depressions and usually are whiter than the surrounding mucosa, though sometimes they may appear slightly pink. The mucosa of the hard palate is tightly applied to bone. As a result, the soft tissue of the hard palate is thinner and less vascular than that of the soft palate.

In the most common type of nicotine stomatitis, the orifices of mucous glands become red, whereas the surrounding mucosa remains normal or is slightly blanched. Such lesions, repeated throughout the posterior two-thirds of the palatal mucosa, produce a pattern of tiny red dots against a background of normal or pale mucosa. The dots vary in size but generally are about 0.5 mm. in diameter. The lesions are located posteriorly in the palate because there are more glands posteriorly than anteriorly.

In the papular lesion, the appearance of the common lesion is greatly exaggerated, the red dot becoming an umbilicated center for the papule of grey mucosa. The papule is firm and not tender and the lesions are multiple.

Even more unusual than the papular lesion is the ulcerative lesion of nicotine stomatitis. Biopsies demonstrate granulation tissue and chronic inflammation but no evidence of neoplasm or specific granuloma. These lesions are not very painful unless severely infected.

The granulomatous lesion of nicotine stomatitis is another advanced lesion which appears as a large granuloma with a central depression. The adjacent mucosa is very blanched. The palate appears as though a boil were about to form or a foreign body to be extruded. Other granulomatous lesions of nicotine stomatitis may produce deep vertical rugae and furrows in the palate.

The soft palate lesion is fairly common but easily overlooked. There is a fine, pink, wartlike or papillary formation over much of the soft palate mucosa. Smoking also causes a hyperemia of the soft palate. Smoking tends to cause the hard palate to become blanched and the soft palate reddish so that the normal color difference between the hard and soft palates is accentuated.

Except for the ulcerative and the large, granulomatous lesions, nicotine stomatitis is virtually asymptomatic. Nicotine stomatitis clears only when the patient stops smoking.

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Public health dentistry

The Braintree experiment

Frank St. D. Rowntree. *Internat.J.Health Educ.* 2:73-79 April 1959

To assess the effectiveness of dental health education, a full-scale dental health project was carried out within a school community in Essex County, England. The school had about 450 students and is situated in a country town of about 10,000 population. Three dental health goals were set: (1) the removal of fear of dental examinations and treatment, (2) the establishment of correct eating habits, and (3) the establishment of good oral hygiene habits. Meetings were held with the teaching staff to explain the aims of the project. Teachers were supplied with leaflets, posters and small display units. To assess the effectiveness of the project, before it began the state of oral hygiene of the children was determined, and a questionnaire was used to assess the children's knowledge and attitudes toward dental health.

The project was carried out during a dental health week in February 1958. Activities consisted of film presentations; dental health activities in the classroom; meetings between dental, medical and teaching staffs, and between parents, teachers and dental health educators; and a large dental exhibit erected in the school. The exhibit consisted of three cubicles, each about 10 by 6 feet, centered on the following themes:

1. Removal of fear—A completely equipped dental surgery was shown.

2. Food—Sticky carbohydrates were displayed as foods which cause caries, and raw apples, carrots and celery were displayed as detergent foods. Toothbrushes were shown.

3. Oral hygiene procedures—Eight colored, three-dimensional displays showed the proper toothbrushing technic.

After the children, in groups of 20, were conducted through the exhibit, all signs of apprehension vanished. They were allowed to manipulate the dental chair and other equipment. The effects of chewing sticky foods and candy were demonstrated by means of small black liquorice sweets. These were chewed by the children who then examined each other's mouths with dental mirrors to see the black particles adhering to the teeth. The children then were given apples to chew; the striking cleansing effect of this detergent food was demonstrated. In the third cubicle correct oral hygiene procedures were shown.

At the end of the week's project, it was agreed that low intensity dental health education should be continued by class teachers.

Six months after the first survey and about five months after the dental health week, a second survey was made. The attitudes to food had altered—almost all the children now realized that raw apples, fresh fruits and vegetables are better for teeth. There was a doubling in the number of children who believed that the dentist's function was to protect teeth, and a reduction in the number who believed that his function was to pull out their teeth. The oral hygiene of the children had improved by an estimated 13 per cent. The number of mouths in a high state of cleanliness was still higher among the girls than the boys; the main effect was on the older groups of children.

The results suggest that educational campaigns can promote improved oral hygiene and a greater awareness of the benefits to be derived from dental health, particularly where the cooperation of parents and teachers is gained.

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Alveolar bone loss as a function of tobacco consumption

Arnulf Arno, Olav Schei, Arne Lovdal and Jens Waerhaug. *Acta odont.scandinav.* 17:3-10 May 1959

The effect of tobacco consumption on alveolar bone resorption was evaluated roentgenographically in 728 male workers and staff members employed in a modern industrial plant in Norway. The men were classified in five-year age groups; they ranged in age from 21 to 45 years old. Tobacco consumption was assessed on the basis of

interrogation. Oral hygiene was assessed. A set of ten dental roentgenograms was taken of each subject. By means of a translucent ruler, the alveolar bone loss was measured as a percentage of maximum bone height adjacent to the mesial and distal surfaces of each tooth.

On the basis of the statistical evaluation, the following conclusions seem to be justified:

1. Alveolar bone loss increases with increased tobacco consumption.

2. Tobacco consumption may be a complicating factor in the etiology of periodontal disease, but it is hardly a dominating factor. Oral hygiene is a more important factor.

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The prevalence of dental caries in relation to maturity

J. N. Mansbridge. *Arch.Dis.Childhood* 33:455-464 Oct. 1958

School children in Edinburgh were examined to determine if a relationship existed between the incidence of dental caries and height and weight.

When children of the same chronological age and at an equal stage of dental development were compared, it was found that children further advanced in maturation had a higher DMF rate than those who were less advanced. This difference in DMF rate appeared to influence the dentition as a whole. For children under 12 years of age, the differences in DMF rates between the tallest and shortest and between the heaviest and lightest children were both insignificant and inconsistent.

It was concluded that in boys earlier sexual maturation is associated with an increased prevalence of dental caries. For girls no statistically significant evidence was obtained to indicate that a similar relationship exists, although other evidence suggests that this may be so.

For both sexes those children who reach the stage of pubescence early have a greater number of permanent teeth erupted than do nonpubescent children of the same chronological age.

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Sweet tooth and decay

W. J. Martin. *Brit.M.J.* 5108:1357-1358 Nov. 29, 1958

Proper evaluation of the effects of habitual chewing of sugar cane and of the possible relations between this habit and the development of dental caries necessitates large-scale investigations of the dental health condition in the children of the West Indies.

J. D. King conducted a limited survey in various areas of Trinidad and British Guiana. In some of the districts sugar cane is cultivated (and chewed by children) and in other districts no sugar cane is produced.

Children from 12 to 14 years who do not chew sugar cane have an insignificantly higher percentage of carious permanent first molars than children of the same age who habitually chew sugar cane. The children of British Guiana have a significantly higher percentage of carious teeth than the children of Trinidad.

The incidence and the extent of caries in permanent incisors—which are more accessible to friction during chewing—are significantly higher in children who chew sugar cane than in those free of this habit.

The incidence of caries in all erupted permanent teeth in the children of both colonies is extremely high and almost identical with the caries incidence in the children of East London.

The incidence of periodontal disease appears to be higher in the children residing in districts where sugar cane is not produced than in those in districts producing it. This advantage of children who chew sugar cane probably is due to the continuous dislodging of calculus by the chewing action. The habit also seems to counteract other sources of irritation.

Specific susceptibility to both caries and periodontal disease in the children of the West Indies is comparatively low and, if found, affects more the Negroes and East Indians than the Caucasians.

The following conclusions were reached:

1. If children are provided with an adequate diet, neither habitual sugar-cane chewing nor an increase in the amount of sugar in the diet affects the susceptibility to caries within a period of at least two years.

2. The increase in the incidence of caries observed during the recent years probably is caused by the rapid growth in the popularity of lollipops and other candies.

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Mottling of enamel in Mecca and the Arabian Peninsula—a survey and research study carried out in Saudi Arabia

Mohamed D. El Tannir. *Am.J.Pub.Health* 49:45-52 Jan. 1959

An examination of 570 adults and children in Mecca, where the drinking water contains from 1.5 to 2.0 ppm fluoride, revealed that 70.5 per cent had mottled teeth. Of those examined who had been born in Mecca and had spent their childhood there, 90.8 per cent had mottled teeth.

Of the 570 subjects examined, 357 (62.6 per cent) were caries-free. Of the 570 subjects, 355 (62.0 per cent) had no periodontal disease. Among inhabitants who were born and had lived their childhood outside Mecca and did not show fluorosis, 55.7 per cent were caries-free and 42 per cent had no periodontal disease.

Permanent teeth were more affected with mottling than were deciduous teeth. The incisors were most clearly affected; the upper central incisors more than the lateral incisors; the maxillary incisors more than the mandibular incisors, and the labial surfaces more than the lingual surfaces. Discolorations were either deep brown, yellow or chalky white patches.

6 (A) *Talaat Harb Street, Cairo, Egypt*

A survey of oral health, Qalyub Project, Egypt

M. G. Wheatcroft and C. R. Klimt. *Bul.WHO* 20:133-148 Jan. 1959

An oral health survey of 4,324 residents of three villages near Cairo, Egypt, revealed that the number of carious teeth per individual in this group was 2.3, which is lower than that reported for the over-all population of the United States, but that the prevalence of periodontal disease was about three times as high as that reported in the United States.

The majority (75.8 per cent) of the Egyptians surveyed had normal occlusion. The predominant type of malocclusion (5.7 per cent) was Class I. The number of DMF teeth per individual was 5.8. Exactly 24.4 per cent of the males and 31.0 per cent of the females had gingivitis; 15.9 per cent of the males and 10.0 per cent of the females had angular cheilosis; 10.7 per cent of the males and 6.4 per cent of the females had enlarged parotid glands. A statistically significant relationship existed between parotid gland enlargement and angular cheilosis.

Of the 4,324 persons examined, 69 per cent were classified as having good oral hygiene. Since none of the subjects reported brushing the teeth, it was concluded that maintenance of a clean mouth was dependent on mechanical self-cleansing factors, such as type of dental arch, tooth form and type of food consumed.

Only 2.7 per cent of those examined had developmental defects or hypocalcification of the teeth. Only 2.0 per cent had dental prostheses.

A study of water samples from several sources showed that the fluoride content ranged from 0.1 to 0.3 ppm, that is, below the level that gives adequate protection against caries.

U.S. Navy Dental School, Bethesda, Md.

Excessive fluoride in water and bone chemistry: comparison of two cases

F. J. McClure, H. G. McCann and N. C. Leone. *Pub.Health Rep.* 73:741-746 Aug. 1958

Chemical analyses of skeletal tissues of two women have provided new data on the effect on bone composition of excessive amounts of fluoride in drinking water. One of these women, subject A, 74 years old, lived for 24 years prior to death in Washington, D.C., where the drinking water contained 0.2 ppm fluoride. The other, subject B, died at 78 years after 34 years of residence in Bartlett, Tex., where the drinking water contained 8.0 ppm fluoride. Subject A died of a heart attack, Subject B of a cerebral vascular accident.

In subject B the fluoride in dry, fat-free skeletal tissues ranged from 0.512 to 0.653 per cent, as

compared to 0.062 to 0.092 per cent fluoride in the skeletal tissues of subject A, comparable in age, height, weight and sex.

The data available through the present study provide additional evidence regarding the threshold level of fluoride which may be tolerated by human skeletal tissues. As much as 0.5 to 0.6 per cent fluoride in the bones of subject B did not prove to be a physiologic hazard. This is about ten times the quantity of fluoride regarded as normal. Roentgenographic examination and medical and clinical studies made prior to the death of subject B did not reveal any skeletal abnormalities or systemic conditions of consequence to health or well-being which could be associated directly with the remarkable increase in the skeletal fluoride content.

There was some indication that the prolonged use of drinking water containing 8.0 ppm fluoride accounted for an increase in the ash and a slight increase in the calcium content of the skeletal tissues.

It must be concluded in the light of the available evidence that human skeletal tissue may have a high degree of physiologic tolerance to accumulations of fluoride.

National Institute of Dental Research, Bethesda, Md.

The mirror as an aid in toothbrushing and oral physiotherapy

Frank G. Everett and Donald J. Passmore. *J.West.Soc. Periodont.* 6:104-105 Dec. 1958

Many dentists instruct their patients in the various technics of oral hygiene. With the aid of toothbrush and model, the dentist first should demonstrate and describe the correct method. Next, the patient is given a hand mirror at least five inches in diameter; the dentist repeats the demonstration in the patient's mouth, after which the patient with brush emulates the demonstration while looking into the mirror.

If the patient can observe what he is doing, he is much more likely to carry out the dentist's instructions correctly. Although some patients feel that they have mastered the technics of oral hygiene and no longer need to see what they are doing, usually they are mistaken. A patient who is not observing his brushing is apt to overlook and skip certain areas. Visual observation is especially advantageous when using the interdental rubber tip stimulator.

The daily performance of oral hygiene at home may be performed either standing or sitting. The sitting position is preferable psychologically because the seated patient probably will spend more time with oral hygiene measures.

The most convenient arrangement is for the patient to be seated at or near the wash basin in the bathroom, looking into a tilting mirror which is on the drainboard nearby. Any flat surface of the proper height will serve as a table for the tilting mirror.

If a standing position is employed, the mirror behind the wash basin will serve, especially if it is large. In this position, however, the patient can not easily see the lingual surfaces of the upper posterior teeth.

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Dental caries in Maryland children after 5 years of fluoridation

A. L. Russell and Carl L. White. *Pub.Health Rep.* 74:289-295 April 1959

A group of white, native-born children in Prince Georges and Montgomery Counties, Md., has been examined yearly since fluoridation of the community water supply in 1952.

Significantly more children were free of caries in deciduous teeth at ages five and six years, and significantly more were free of caries in permanent teeth at all ages from six through ten years, in 1957 than in 1952. At five and six years of age, respectively, 87 per cent and 49 per cent more children had caries-free deciduous teeth in 1957 than in 1952.

The younger the child at the time of fluoridation, the greater was the degree of caries inhibition in permanent first molars. In older children, the greater degree of caries inhibition was seen in those tooth types first exposed to fluoride at the earlier stages in development. The critical point would seem to be the time of eruption. Tooth types with first fluoride exposure essentially coincident with eruption show minimal caries inhibi-

tion, and those in eruption two to three years at the time of fluoridation show no inhibitory effect which can be detected in counts of DMF teeth. In short, at this point (the fifth year of fluoridation) and measured in this way, the degree of caries inhibition in any tooth type seems to be related to the length of fluoride exposure prior to eruption and the consequent risk of attack by caries.

National Institute of Dental Research, Bethesda, Md.

The effect of 'trace elements' on experimental dental caries in the albino rat

B. J. Kruger. *Univ.Queensland Papers* 1:1-28 Jan. 1959

A number of experiments were conducted to test the hypothesis that some trace elements, administered as suitable salts to albino rats during the period of amelogenesis (from birth to 21 days of age in the rat), may increase the resistance of molars to caries. The resistance to caries was gauged after a 20 week cariogenic dietary regime.

The effects of eight elements—aluminum, boron, copper, fluorine, iodine, manganese, molybdenum and vanadium—were studied, some at four dosage levels, others at three and the remainder at two. The salts also were investigated in a variety of interactions between two, three, four and five elements, and also at a number of combinations of the various dosage levels.

Of the elements studied, boron and fluoride were most effective in reducing the caries attack. Copper, molybdenum and vanadium also showed a significant reducing effect.

A mixture of the salts of boron, copper, manganese and molybdenum did not reduce dental caries. A mixture of these four salts plus sodium fluoride significantly reduced dental caries but was not as effective as sodium fluoride alone.

Significant effects were produced by interaction between salts of the following elements: boron and fluorine, aluminum and fluorine, and aluminum and vanadium.

Department of Dentistry, University of Queensland, Brisbane, Australia

Incidence of dental caries in school children in Poland

Krystina Badzian-Kobos and Ignacy Bielas. *Czas.stomat.* 11:637-650 Oct. 1958

In an effort to provide advice and assistance to the public health authorities in initiating a new school dental service, a survey of the incidence of dental caries has been made by the staff of the Dental College of the University of Lodz, Poland.

The survey was designed to ascertain data on the previously observed differences in the caries incidence between children residing in urban districts and those living in rural areas. It also was designed to show whether the differences—if they were statistically significant—were related to the different diets regularly consumed.

The survey consisted of an investigation of 73,953 teeth of 2,541 children. Four groups were formed: (1) a 6 to 7 year old group; (2) an 8 to 10 year old group; (3) an 11 to 12 year old group, and (4) a 13 to 15 year old group. Each group was subdivided into an urban and a rural division.

The following conclusions were reached:

1. The incidence of dental caries among the school children in Poland is extremely high.

2. The previously observed difference in the dental condition of school children residing in urban districts and those residing in rural areas is statistically too insignificant to be related to the different diets consumed in urban and rural areas.

3. Endodontic treatment, although urgently needed, appeared to be neglected. Multiple extractions were the only procedures performed to arrest the progress of caries.

4. A statistically significant difference in the caries incidence was observed between girls (52.84 per cent) and boys (42.54 per cent).

5. More carious lesions were found in the lower first molars than in other teeth.

6. Lower cuspids were found to be extremely resistant to caries and, therefore, remained longer in the oral cavity.

7. The largest percentage of secondary caries was discovered in defects (Black's Class IV cavities).

Zakladu Stomatologii Zachowawczej, Uniwersytet w Lodzi, Poland

Therapeutics

The effect of mouthwashes on the oral flora

Morris Ostrolenk and William Weiss.
J.Am.Pharm.A.,Sci.Ed. 48:219-221
April 1959

In the evaluation of the antiseptic activity of mouthwashes studied in vivo, two measurements are of main significance. One of these is the count of microorganisms remaining in the oral cavity after the use of a compound. The second measure is the rapidity with which the bacterial flora of the oral cavity returns to its normal count.

Five commercial mouthwashes, with a sterile physiological salt solution as a control, were tested in six subjects. A subject was given, at hourly intervals, four 30-second rinses, each rinse consisting of 20 cc. of 0.85 per cent salt solution. Midway between the second and third rinses, the subject was given an oral rinse consisting of one of the five antiseptic mouthwashes or of the control. After each rinse, the wash solutions were expectorated into sterile petri dishes and cultured.

The methods employed in the second experiment were essentially those used in the first, with the following differences: (1) the antiseptic mouthwash or the control was given between the first and second hourly rinses, and (2) the oral rinse solutions were planted, in duplicate, in thioglycollate shake agar tubes for total bacterial counts.

The five groups of microorganisms studied—streptococci, staphylococci, yeast, fusobacteria and lactobacilli—occur in different quantities in the mouths of different persons.

In the present study, the most effective commercial mouthwash permitted an average of 13.1 per cent of the bacteria to survive 30 minutes after use of the mouthwash. Within an hour and a half after use of this mouthwash, the average number of bacteria recoverable by a rinse was 28 per cent of what it had been prior to washing. At this point, there was an average of 40,000,000 recoverable bacteria present in the mouths of the test subjects.

The most effective mouthwash reduced, at 30 minute and 90 minute levels, the number of streptococci and fusiform bacteria in the mouth, but in neither instance destroyed these microorganisms to an extent such that their rapid multiplication was retarded significantly. The product did not demonstrate significant antibacterial activity for the other groups of microorganisms. None of the five mouthwashes showed significant reductions for all five bacterial groups.

The results of the second experiment indicate that there is no long-lasting effect to be derived from use of the mouthwashes tested.

(William Weiss) Division of Antibiotics, Food and Drug Administration, Washington, D.C.

Hydrochloric acid therapy and the chronic sore mouth

John W. Hazlet. *J.South.California D.A.*
26:416-421 Dec. 1958

Hydrochloric acid, administered by tablet as a digestive supplement, can aid the dentist and physician in managing the patient with chronic sore mouth. Achlorhydria, indicating the need for this supportive therapy, is readily diagnosed in the medical laboratory by means of the indirect (tubeless) gastric analysis.

Typical oral complaints of achlorhydric patients include: tenderness of the gingiva and edentulous alveolar ridges, rawness of the buccal mucosa, burning of the tip or lateral posterior borders of the tongue, burning beneath the contact areas of removable prosthetic devices, and dryness of the mouth and tongue associated with loss of taste sensation. The most characteristic oral finding is atrophy and thinning of the mucous membranes. The buccal mucosa often has a pale, glistening appearance suggestive of a moderate edema. The lingual papillae frequently have decreased in number and prominence. Most patients are edentulous, and many can tolerate their dentures only for a few hours a day.

Of 138 women aged 50 to 69 years with achlorhydria, in 75.4 per cent the condition im-

proved by hydrochloric acid supplementation; in 5.8 per cent no improvement occurred; in 4.3 per cent unfavorable responses developed, and in 14.5 per cent there was inadequate information.

In this study, a tablet was used in which the hydrochloric acid is combined with betaine as a vehicle, and with a timed disintegration in the stomach. Two tablets with each feeding were prescribed, as was a high protein diet with a suggested minimum of four ounces of meat or equivalent protein foods at each meal. Patient toleration of both diet and medication was good in 81 per cent of the patients.

It is not suggested that achlorhydria is the sole cause of sore mouth in the older patient; but in the presence of achlorhydria, the administration of hydrochloric acid will be the most useful adjunct to treatment. The dentist can render a useful service to his patient by ordering medical tests for achlorhydria whenever indicated and prescribing medication to replace inadequate gastric hydrochloric acid secretion.

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Treatment of scarlet tongue

J.A.M.A. 169:900-901 Feb. 21, 1959

Q.—One patient in five who comes to this office [in Arkansas] manifests a scarlet tongue, without soreness. Gastrointestinal disturbances are present, and some patients have systemic symptoms and findings. Histories reveal that these patients have taken broad-spectrum antibiotics, alcohol over a period of time, and large amounts of vitamin B or vitamin B complex; and that diabetes or other metabolic conditions were present. The most likely diagnosis is moniliasis. Vitamins, calcium, nystatin and several other agents have been used, to no avail. What is the best treatment for generalized moniliasis?

A.—There is no panacea for redness of the tongue and buccal mucosa. For monilial infection of the mouth, the most effective local remedy is a mouthwash containing a nystatin tablet freshly dissolved in about 60 cc. of water, used from four to six times a day. Patients in whom vitamin B complex has proved ineffective sometimes are benefited by large doses of vitamin A, particularly in the form of buccal tablets, 150,000 units each, dissolved in the mouth once daily, ostensibly to get the local effect of vitamin A on the buccal mucosa. From the description given, pellagra cannot be eliminated definitely as a possible cause.

A.—The causes of scarlet tongue are many and varied. Among diseases associated with color changes on the tongue are scarlet fever, some of the anemias and pellagra. Food and drugs often are causative agents. The pronounced increase in the use of lipstick is to be considered. A positive diagnosis of moniliasis should be confirmed. In these patients, the suggested action would be to remove the cause if ascertainable. All medicaments should be withdrawn, and a high protein, low fat, low carbohydrate diet should be given along with yoghurt or lactobacilli preparations.

A.—It seems unlikely that these patients are suffering from generalized moniliasis. The clinical manifestations described have been observed in the absence of *Candida* and have been attributed to a temporary vitamin abnormality associated with the alteration in the bacterial flora of the intestinal tract, induced by antibiotics. The symptoms usually disappear after the withdrawal of antibiotics, though this may require some time. Generalized moniliasis usually affects severely debilitated patients who have been intensively treated with broad-spectrum antibiotics, adrenocortical steroids or roentgen-ray irradiation. In such instances, aspiration pneumonia or *Candida* septicemia may develop. Blood cultures should be obtained in an effort to demonstrate the typical creamy, yeastlike colonies which grow well on Sabouraud's medium. The treatment of choice for the generalized infection is parenterally given amphotericin B, which has been shown to be effective in clearing the blood stream of *Candida* within a few days. The recommended dosage is 0.5 to 1.0 mg. per kilogram of body weight per day, to be given intravenously over a period of six hours. A significant clinical response has occurred after four to eight weeks of treatment. Side effects such as chills, fever, headache, nausea and vomiting are common, but are not so severe as to contraindicate use of the drug.

A history of prolonged treatment with broad-spectrum antibiotics frequently can be elicited from patients with scarlet tongue. Nystatin has proved to be most efficacious in the treatment of local infection. If the oropharynx is involved, nystatin should be used in suspension as a gargle every three to four hours. When it is thought that the entire gastrointestinal tract is involved, tablets containing 500,000 units of nystatin should be given four times daily. This type of treatment is directed at local infection, since significant blood levels of this drug cannot be achieved with oral therapy.

535 North Dearborn Street, Chicago 10, Ill.

Tranquilizers as premedication for dental patients

J.Oral Surg.,Anesth.& Hosp.D.Serv. 17:82 July 1959

Q.—Are there any advantages in using one of the tranquilizers as premedication before dental treatment?

A.—In recent years a number of tranquilizers (ataraxics) have been marketed. As a group, they are supposed to produce a sense of well-being without diminishing mental acuity. These drugs have been used successfully in the treatment of a variety of mental conditions but their effectiveness in the normal person still is in doubt. For premedication of the dental patient a drug should be relatively short acting and should not produce mental depression or any degree of significant side effects.

Though the tranquilizers generally do not meet the foregoing requirements for ideal dental premedication, they have a place in dentistry and, more particularly, oral surgery. These drugs have a sedative effect and produce, more in some patients than in others, a sense of well-being. They potentiate the action of narcotics and barbiturates. It is the sedative effect and the potentiation of the action of other drugs that make these agents useful.

Trifluprom azine (Vesprin), one of the newer psychotherapeutic agents, has a greater tranquilizing potency than chlorpromazine hydrochloride and causes fewer undesirable complications. Trifluprom azine proved to be most effective when used as a sedative prior to surgery under local anesthesia. When given intravenously in small doses, the drug produced a light sleep in most patients. The patients became cooperative and an improvement was noted in their response to the emotional stress of the situation. Postoperative recovery was rapid and no complications were noted. Reports indicate the superiority of this drug over other tranquilizers in preventing or treating emesis and for potentiating the effects of general anesthetics.

222 East Superior Street, Chicago 11, Ill.

Clinical appraisal of two sedatives in pedodontic practice

R. Harris and H. R. Sullivan. *Austral.D.J.* 4:92-97 April 1959

Two sedative drugs—pentobarbital and methylparafynol (methylpentynol)—were tried clinically to determine their effectiveness for minor oral surgery in children ranging in age from three through six years old. The double blind method was used. Two placebos, identical in color and taste with the two drugs, were utilized.

Thirty minutes before operative procedures were to start, the drug or a placebo was administered in accordance with a plan designed to ensure a random distribution. Either 32 mg. of pentobarbital elixir or 250 mg. of methylpentynol (the dosages recommended by the manufacturers), or equivalent amounts of placebo, were given orally with added water. Anesthesia was obtained by the use of lidocaine hydrochloride administered as a mandibular block. Two hundred and thirty-three children were treated. Observations were recorded on four phases of the child's reactions (general demeanor, crying, agitation, and composure) to the injection and the extraction. At the conclusion of each operation a discussion was held between operator and observer to decide whether the sedation should be recorded as a success or failure. At the conclusion of each session the drug or placebo used was identified.

Under the conditions of this clinical trial, the sedative drugs had no more observable effect than the placebos.

United Dental Hospital, Sydney, Australia

Case reports

Facial actinomycosis misdiagnosed as tetanus

James Graham, Kenneth Malmberg, Robert Patey and Alan Rubenstein. *Illinois M.J.* 115:271-273 May 1959

A 33 year old machinist was referred by his family physician to the Springfield Clinic because his jaw muscles had gradually stiffened until he was barely able to open his mouth. One month earlier the patient had mashed his left index finger on a grinding wheel, for which he had been treated and received an antitetanus inoculation.

The patient could not open his mouth more than 3/8 inch. There was tenderness over the left masseter muscle. Roentgenographic examination of the mandible showed it to be normal. The left index finger was swollen, red and tender.

The patient was hospitalized. Cultures taken from the area of the injury to the finger were negative for *Clostridium tetani.* The patient was given 100,000 units of tetanus antitoxin and 1,200,000 units of penicillin daily. Improvement set in within 24 hours and within six days he was discharged, with much more motion of the mandible.

Ten months later, the patient again had trouble in opening his mouth. There was a lesion on the anterior, inner aspect of the left masseter muscle. The patient was treated with adrenocorticotropic hormone (ACTH) and skeletal muscle relaxants for four weeks, without improvement. Dental consultation failed to confirm the presence of malocclusion.

Fifty weeks after the injury to his finger, the patient again was hospitalized and the palpable mass on the left masseter muscle was explored. Culture removed from the lesion confirmed the diagnosis of actinomycosis. The patient was given nystatin 1,000 units daily, chloroamphenicol 1,000 mg. daily, penicillin 1,200,000 units daily, plus saturated solution of potassium iodide. Within four days his high temperature returned to normal and the incision healed promptly with no subsequent drainage. He has had no evidence of recurrent actinomycotic activity in the one year since his last hospitalization.

This case of actinomycosis, because of coincidental features, resembled tetanus. The actinomycotic lesion was masked by vigorous antibiotic therapy during the initial hospitalization. The possibility of actinomycosis should be kept in mind in obscure conditions around the cervicofacial area, and in particular when any sort of a mass or infiltration is noted.

Springfield Clinic, Springfield, Ill.

Lipstick cheilitis

J.A.M.A. 170:1883 Aug. 8, 1959

Q.—A patient has tried many different types of commercially available lipstick, all of which produce pronounced blistering and allergic reaction. What ingredients would cause this reaction? Are there any lipsticks this patient could use?

A.—Cheilitis caused by lipstick is not uncommon. The staining dyes used in many lipsticks—eosin dyes or halogen derivatives of fluorescein—are believed to be rather frequent photosensitizers. Lipsticks are available which do not contain eosin dyes, but such lipsticks are nonindelible and their lasting powers are minimal. They must be requested specifically.

Other ingredients ordinarily found in lipsticks are relatively innocuous. They include oils, fats, waxes and perfumes.

535 North Dearborn Street, Chicago 10, Ill.

Angioneurotic edema of the lip: report of case

Paul Courturier. *Inform.dent.,Paris* 41:508-510 April 30, 1959

Angioneurotic edema is characterized by suddenly appearing, acute, transitory and localized swellings usually occurring in the maxillofacial region. The lesions resemble those of urticaria but are larger and far less widely distributed. In some instances, a hereditary origin is suspected; others

seem to be caused by allergic reactions to certain foodstuffs.

Despite the numerous inconsistencies encountered in the explanation of the various factors and mechanisms involved in the development of angioneurotic edema, the primary causative factor usually can be determined by differentiating localized edema from generalized edema.

A 50 year old man appeared at the dental office for treatment of a hard edema of the upper lip which—according to the patient—had occurred and recurred seven times during the last year. Although angioneurotic edema usually occurs as a result of changes in the basic physiologic mechanisms and acts similarly in a variety of diseased conditions, in the case reported the hard swellings appeared only after eating of certain foodstuffs, mainly fish and sausages.

Because allergic reactions to certain foodstuffs, as well as an inadequate diet, may produce hypoproteinemia and angioneurotic edema, the occurrence and recurrence of the local distribution of excessive fluid in the upper lip could not be explained by any single causative mechanism.

Antihistamine therapy, consisting of the oral administration of 30 mg. of diphenhydramine hydrochloride four times daily, and avoidance of the possible allergens (fish, sausages and spices) produced gradual improvement and cure. There were no serious side effects, and since completion of the treatment four years ago, neither the angioneurotic edema of the upper lip nor any of the often-associated conditions such as urticaria, erythema or purpura occurred.

Aix-les-Bains/Savoie, France

Tuberculosis of the oral cavity: report of case

Rudolf Zellner. *Deut.Stomat.* 9:520-521 June 1959

The presence of large numbers of *Mycobacterium tuberculosis* var. *hominis* or *bovis* in the oral cavity, may produce a specific form of inflammatory tissue reaction. The typical response of the involved tissue cells consists of the development of one or several nodules or papules, the so-called tubercles. Tuberculosis may be considered as one of the infective granulomas with specific oral manifestations; syphilis and actinomycosis are the other members of this group.

Although tuberculous lesions occur comparatively seldom in the oral cavity, the case reported may serve as a reminder that tuberculosis should always be considered in the differential diagnosis of oral lesions.

A 16 year old girl appeared at the Clinic of the Dental Institute of the Humboldt University in Berlin for treatment of a gradually increasing swelling on the right side of her upper jaw, which impaired the masticatory function. The patient's history revealed that several weeks prior to admittance the upper right central and lateral incisors had been extracted.

The swelling progressed unchecked in spite of various medications, including streptomycin and hydrocortisone. Bacteriological tests revealed the presence of *Myco. tuberculosis* in both the lesion and the sputum. Because it is known that tuberculous lesions in the oral cavity do not heal satisfactorily when treated surgically, no attempt at excision was made.

The probable cause for the development of the oral tubercle was an invasion of the microorganisms into the alveoli of the extracted teeth with nonvital pulps, where the microorganisms remained viable for a comparatively long time. It is also possible, but hardly probable, that the cause was a postextraction infection by direct transmission from a person or persons during coughing, sneezing or talking.

The lesion responded readily to chemotherapeutic procedures (para-aminosalicylic acid, and isonicotinic acid hydrazide combined).

The variability in its symptoms makes the lupous or tuberculous lesion in the mouth difficult to diagnose, and often—as in the case reported—only bacteriological tests permit the differentiation between tuberculosis, primary syphilis, hypertrophy and carcinoma (in its initial stage).

Tuberculous lesions in the oral cavity frequently are detected by dentists during routine oral examinations before the presence of the primary disease, usually pulmonary tuberculosis, becomes sufficiently evident to be recognized by the physician.

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Dentistry around the world

Outback dentist

Colin Robinson. *Brit.D.J.* 106:327-329
May 19, 1959

The author recently served as a dental member of the Royal Flying Doctor Service of Australia in Queensland, with an area nearly the size of the British Isles. Except for a concentration of cities and towns on the eastern coast, most of the remaining enormous area is given over to huge cattle ranches and sheep stations; the distance between stations varies from 5 or 6 miles to 25 and 50 miles, over indifferent roads. Each cattle and sheep station has a simple radio transmitter and receiver, used to communicate with neighbors and the outside world. Each station also has a landing strip for the physician's airplane. A physician at the radio base is at the center of a network, with a radius of about 200 miles, dispensing medical advice and assistance. After the medical organization of the Service had become well established, it was improved by adding dental service; previously physicians were asked to extract teeth.

A large truck was designed to carry enough equipment to perform any normal dental operation. The rear half consisted of a dental surgery, with stairs and entrance in back. Inside, the centrally placed hydraulic dental chair was surrounded by cupboards along both walls, containing all the dental equipment, and a small gasoline-driven generator for charging the batteries which powered the drill, lights and dental unit. A stainless steel tank in the surgery was fed from a 40-gallon tank of water and another sink was in the living quarters which occupied a space between the surgery and driver's cabin. The living quarters had two bunks, a clothes cupboard and a heating unit for sterilizing instruments and cooking. The truck carried a small radio transmitter to inform the radio base and neighboring cattle stations of the truck's progress.

The truck was manned by a team consisting of the dentist and a dental technician who also was an able automobile mechanic and general handy man.

Every cattle station was visited every two years. Each route was planned to take from six weeks to five months before returning to base for replenishment of supplies and for overhauling the truck. On longer trips, supplies were delivered to the truck by fortnightly air mail service.

In the bush, it was important to reach a cattle station by nightfall. Next morning, the truck would be parked under a shady tree, cleaned up and the surgery opened. Any cowboy (or "ringer," to use the Australian term) who wanted treatment would be brought in from his camp which might be 20 miles in the bush, and would remain in the station until the dental work had been completed. Complete upper and lower dentures would be finished in two days. If there was dental work to be carried out on Sunday, it was accomplished and the crew took a day off later. Breakfast usually was at dawn, and work went on until midday; after lunch, work continued until teatime.

During the wet season—usually from the end of December through March—the roads were unusable. The dental equipment was packed into two wooden crates and transported, with the dentist and dental technician, by plane to visit mission stations and small towns. Each mission station had its own set of dental instruments in different states of preservation. Lack of electric engines required the use of a foot-operated drill. Some of the tiny bush towns had small hospitals run by a resident matron and staff nurse; here the facilities were more elaborate and all had proper dental chairs.

The openhearted hospitality of Australians and their cheerful help in time of trouble are proverbial; it was a privilege to have brought dental relief to many of them.

North Garden, Treyford, Midhurst, Sussex, England

General

On temperature measurements in teeth

Sven Jarby. *Odont.Tskr.* 66:421-471
Oct. 1958 [in English]

A study of dental literature reveals no description of a measuring technic which permits the exact recording of values in a rapidly varying course of temperature in teeth or small bodies subjected to standard dental procedures. No author has given any account or calculation of the magnitude of the source of error which must be present in temperature measurements in teeth.

According to most authors, it appears to be of minor significance whether the temperature rises caused by a given agent are measured in vitro or in vivo.

In many modes of preparation of the hard tooth structures, the magnitude of temperature rise is such that it will probably induce pathological conditions in the pulp. It is impossible, however, to be precise on this point because the maximum temperature which the intact pulp can tolerate remains unknown.

Water cooling is an effective method of reducing the temperature rises produced by the cutting of the hard tooth structures.

Royal Dental College, Copenhagen, Denmark

Dentistry today at the Colorado State Home and Training School

Olof H. Jacobson. *J.Colorado D.A.* 37:3:15-18
June 1959

Two years ago the author accepted the position of staff dentist at the Colorado State Home and Training School at Ridge. In his first tour through this state institution for retarded children, the author was impressed with the cleanliness of the surroundings, the neatness and courtesy of the children, and with the many dedicated people who care for the children.

Although there had been no regular dentist at Ridge for a long time, a highly acceptable dental operatory was equipped with an S. S. White unit of World War I vintage, a chair, an x-ray unit, an instrument cabinet and a sterilizer using boiling water.

Although some of the patients were more than 60 years old, they were children mentally. The author's main interest is in children, he limits his private practice to pedodontics, and he decided to handle his new patients as children. They responded beautifully. The children at Ridge seem to have an altered threshold of pain. They either are extremely sensitive to pain, or they show little or no discomfort when subjected to rather extensive surgery.

As dental examinations of all the children progressed, several patterns began to emerge. As to caries, either the teeth were in very bad condition or they were in reasonably good condition. For patients in the first category, extractions were performed to eliminate pain and infection. Patients in the second category received prophylaxis and simple restorations. Periodontal tissues generally were in very bad condition. The dentist ordered the attendants to brush the teeth of those children disinclined to or unable to brush their own teeth. Within two years, the results have been excellent.

The incidence of interproximal cavities was extremely low, perhaps because the diet was well balanced. The average patient gets excessive sweets only at holiday times or on special occasions. There is no constant deluge of candy, chewing gum and soft drinks. Whereas in private practice most of the restorations are Class II, at Ridge most are of the pit and fissure type.

At the outset, one of the girl patients was assigned as dental assistant, and this worked out well. In addition to performing the mechanical functions of an assistant, she has proved invaluable in helping to evaluate the personality and potential for cooperation of the patient. If the assistant puts out a tongue depressor instead of a

mouth mirror, it signifies that the next patient will not cooperate too well.

A year ago, the dental clinic acquired the services of another dentist. With two dentists alternating and devoting half time to the clinic, dental service now is available five days a week to the children. Richard D. Hamer, the second dentist, also has a girl patient who serves as dental assistant. Twice a month, the two dentists work together on removal of impacted teeth, biopsies, multiple extractions and endodontics. The service now is fairly comprehensive, embracing everything except crowns and bridges, cast partial dentures and gold foil restorations; these fields have been foregone thus far because of a limited budget and an almost overwhelming amount of work to be done. Now each dentist is systematically seeing all patients in each ward before proceeding to the next ward. Priority still is given to emergency work, but the goal is to get each child on at least a six month recall basis where a prophylaxis and an occasional restoration will be all that is required.

One of the most gratifying parts of dental work at Ridge is witnessing the aid which a serviceable and esthetic denture gives to the morale of a child, in helping him in returning to the outside world. An extensive rehabilitation program is being followed in which trainable children are being trained for suitable employment outside. The dental department cooperates with the speech therapy and psychological departments.

An interesting facet of dental work is the number of dental anomalies seen. The typical microdontia of the mongoloid, of course, is common. Supernumerary teeth are seen more often than in private practice. Also seen are primitive tooth forms, especially in maxillary molars. A statistical study correlating primitive tooth forms with the cause and degree of retardation might shed light on endocrinal or metabolic influences on retardation. The incidence of congenitally missing teeth is slightly higher than is observed in private practice. Among startling anomalies seen are the 48 erupted teeth in one patient, and the excessive growth of the mandible in another patient.

If a dental school is established in the area, a system of rotating dental internships would benefit both institutions.

390 University Boulevard, Denver, Colo.

The oral vibrator: a new appliance for the production of artificial voice

R. V. Tait. *Brit.D.J.* 106:336-340 May 19, 1959

Previously used appliances for the production of artificial voice are the artificial larynx and the external vibrator. Both are cumbersome and unsightly, and the quality of speech produced is poor. A new appliance, the oral vibrator, has been designed to overcome some of the defects of the older devices.

The oral vibrator has an electromagnetically vibrated diaphragm, worn within the oral cavity, and an extraoral component. All sounds thereby generated can be used for voice production, enabling a high order of intelligibility of speech. The appliance is relatively inconspicuous. The frequency of the sound can be altered to produce inflections which add to realism and intelligibility. No special cleaning or maintenance is required.

The intraoral component consists of an artificial palate which can be incorporated into an upper denture. The artificial palate contains an electromagnetically vibrated diaphragm and encloses an air space. The coil of the electromagnet is connected to the extraoral component by fine flexible cables passing out of the corner of the mouth. The most convenient point of exit for the cable is in the buccal sulcus just behind the cuspid, unless gaps between natural teeth indicate some other preferable position.

The extraoral component consists of a small box containing batteries and an electric circuit to supply current to the electromagnet. This component is no larger than the amplifier of a standard hearing aid and can be worn in the pocket. The appliance is activated by pushing a button control on the box, thus setting the diaphragm in the mouth in vibration and enabling the patient to speak.

Adjustment of the diaphragm for maximum sound output is a matter of trial and error, and is best achieved by careful bending of the diaphragm with the fingers until the correct degree of convexity is obtained. The diaphragm is sealed with a thin layer of rubber solution to prevent entry of saliva into the appliance.

With the oral vibrator inserted and the oscillator switch depressed, the diaphragm sets the

air in the oral cavity in vibration at audible volume and pitch. If the patient now performs normal speech movements, the sound can be modulated into words. Intelligibility is increased by interrupting the sound between words. The sound of the speech does not closely simulate the natural voice, but has a strange, mechanical quality; however, it is readily understood and transmits well by telephone. The main limitations are the inability to sound H and NG. When the appliance is first fitted, a speech therapist should teach the patient how to acquire clarity. Once confidence has been gained, the appliance is so simple to use that the possibility of normal life for the laryngectomized patient who cannot acquire esophageal voice is appreciably increased.

The appliance also has applications in the fields of phonetic teaching and research, and in the entertainment industry for "trick voice" effects.

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Advantages of a small-town dental practice

H. P. Landry. *J.Wisconsin D.Soc.* 35:3-5 Jan. 1959

The author has lived and practiced dentistry for the past 41 years in a small town, Cadott, Wis. Although graduates of dental schools seem to scorn the rural communities, the author has talked to few small-town dentists who would trade their practice for the average metropolitan office and clientele.

Antipathy of some dentists to small towns is the result of misconceptions based on imaginative pictures of rural life decades ago. Small towns "ain't what they used to be." The trend toward suburbanization in metropolitan areas has been reflected in most rural regions. Among the advantages of small-town dental practice are income opportunities and community benefits.

In any profession, competency insures success. If a dentist establishes a reputation for fine work, he needn't be concerned whether he is located in the largest city or the smallest town. The cost of establishing an office in a rural community is less than in a big city. The smaller investment is reflected in smaller fees; nevertheless, there is evidence that small-town dentists fare as well as their city counterparts financially, especially when cost of living and overhead expenses are compared. A good rural community is far less liable to be affected by depressions or recessions than are cities. Patients in a small town pay their bills. In the author's 41 years of practice, he has turned over only two bills for collection, and has written off less than 1 per cent of the gross as bad debts. In a small-town dental practice, income is more likely to be substantial, supported by a population far greater than that in the immediate town, and the income is reliable and secure, regardless of shifting economic winds.

Standard complaints against small towns are that they do not offer sufficient social and cultural activities, that they suffer from poor schools, slipshod government and poorly supported churches. Although some of these complaints may have been valid years ago, they are generally not valid today. Most rural communities have taken on all of the good aspects of the suburb while rejecting many of its evils.

In a small town, the dentist's problem is not to find social life but to avoid being absorbed by it. Clubs, organizations and societies form a major part of the life of a rural community. It doesn't take a year to get into small-town "society." Social contacts come to one. Instruction in small-town schools is as varied and effective as in the schools of big cities. Adequate transportation is offered to rural pupils; manual arts, music, athletics and other extracurricular activities now are available to students in the smallest integrated high school. Faculty members are of top caliber, being attracted in ever greater numbers to rural communities. State aid to small towns has made possible good streets, adequate water and sewer systems, excellent parks, and dependable fire and police protection, all at relatively lower cost than in metropolitan areas. Well-equipped medical offices, and competently-staffed law offices are becoming common in small towns. Small-town churches are growing more active and influential.

A professional man in a small community can exert great influence, and can make his voice heard in matters regarding the administration of schools, operation of government and the conduct of commercial life. The professional man is an important part of his community—if he wants to be.

Cadott, Wis.

Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Carpal growth and its relationship to malocclusion. *Clifford James Broussard. 1959.* M.S. *University of Kansas City.*

An evaluation of the microscopic changes of stainless steel used in certain orthodontic technics. *Galen L. Callender. 1959.* M.S. *University of Kansas City.*

Some practical considerations in the retention of orthodontic results. *Charles E. Duncan. 1959.* M.S. *University of Kansas City.*

An electromyographic and cephalometric radiographic investigation of the orofacial muscular complex. *Lewis Grodon Nieberg. 1959.* M.S. *University of Kansas City.*

The general practitioner—an interceptive orthodontist. *Robert J. Orr. 1959.* M.S. *University of Kansas City.*

Current information concerning cleft palate and orthodontic relationships. *Malcolm A. Winer. 1959.* M.S. *University of Kansas City.*

A preliminary study of an orthodontic torquing mechanism. *Edward Ivan Wolf. 1959.* M.S. *University of Kansas City.*

Technical aspects of cephalometrics. *Gerd S. Wolman. 1959.* M.S. *University of Kansas City.*

Studies in mandibular dysplasia: resection of the right internal pterygoid muscle in the rat. *Charles David Simpson. 1958.* M.S.D. *University of Minnesota.*

The use of anorganic bone to increase alveolar ridge height in partially edentulous jaws of dogs. *Roger Jerome Burke. 1959.* M.S.D. *University of Minnesota.*

Investigations into the well-proportioned face. *William Speight Debnam. 1959.* M.S. *University of North Carolina.*

Hypnosis and pernicious tongue habits. *Carl Dann III. 1959.* M.S. *University of North Carolina.*

Correlation of mesiodistal crown diameters of certain teeth. *Ledyard E. Ross. 1959.* M.S. *University of North Carolina.*

A method of defining the soft tissue profile. *Vito P. Bash. 1958.* M.S. *University of Washington.*

Problems of anchorage in orthodontic practice (Das Problem der Verankerung in der Kieferorthopädie). *Ingrid Roels. 1958.* DR.MED.DENT. *University of Bonn, Germany.*

Anchorage for bridges by using vital anterior teeth as abutments (Zur Verankerung von Brücken auf vitalen Frontpfeilern). *Otto Dederichs. 1958.* DR.MED.DENT. *University of Bonn, Germany.*

Normal and pathologic histology of the dental pulp during senescence (Histologie und Pathohistologie der Zahnpulpa im Senium). *Hugo Bölting. 1958.* DR.MED.DENT. *University of Bonn, Germany.*

Penicillin focal test and Cupping test as diagnostic aids in the detection of foci, especially of dental foci (Der Penicillin-Fokaltest und der Cuppingtest als diagnostische Hilfsmittel zum Nachweis von Herden unter besonderer Berücksichtigung der Zahnherde). *Hans Müthlein. 1958.* DR.MED.DENT. *University of Bonn, Germany.*

Industrial dentistry: the industrial dentist (Werkzahnheilkunde: Der Werkzahnarzt). *Artur Heid. 1958.* DR.MED.DENT. *University of Bonn, Germany.*

Results of treatment of carcinoma of the tongue at the Surgical Clinic of the University of Bonn from 1928 to 1956 (Ergebnisse der Behandlung des Zungenkarzinoms in der Chirurgischen Universitätsklinik Bonn von 1928 zu 1956). *Gunivalds Meilands. 1958.* DR.MED.DENT. *University of Bonn, Germany.*

Clinical and experimental investigations of the effects of the local anesthetic agent "Stadacain" (Klinisch-experimentelle Untersuchungen über die Wirkungen des Oberflächenanästhetikum "Stadacain"). *Ansgar Kramer. 1958.* DR.MED.DENT. *University of Heidelberg, Germany.*

Cause, prevalence and localization of myocardial infarctions occurring in dental practice (Ursachen, Häufigkeit und Lokalisation der Myocardinfarkte in der zahnärztlichen Praxis). *Margot Joest-Mayer. 1958.* DR.MED.DENT. *University of Heidelberg, Germany.*

Clinical and experimental studies of measuring methods of scattered rays in dental practice (Klinisch-experimentelle Studien über Messverfahren von Streustrahlen in der zahnärztlichen Praxis). *Nikolaus Hell. 1958.* DR.MED.DENT. *University of Heidelberg, Germany.*

Pharmacology of recently developed water-soluble theophylline derivatives with sympathomimetic properties (Zur Pharmakologie neuer wasserlöslichen Theophyllinderivate mit sympathicomimetischen Eigenschaften). *Ute Kaufmann. 1958.* DR.MED.DENT. *University of Heidelberg, Germany.*

Clinical and experimental studies of methods to measure the scattered rays during extraoral roentgenography of the jaws (Klinisch-experimentelle Studien über die Messung von Streustrahlen bei extraoralen Röntgenaufnahmen der Kiefer.) *Froher Knittel. 1958.* DR.MED.DENT. *University of Heidelberg, Germany.*

Comparative investigations of the effects of the newly developed water-soluble derivatives of theobromine and theophylline in nonanesthetized dogs (Vergleichende Untersuchungen über die Wirkungen der neuen, wasserlöslichen Derivate von Theobromin und Theophyllin bei nicht narkotisierten Hunden). *Fritz Raff. 1958.* DR. MED.DENT. *University of Heidelberg, Germany.*

Investigations of the activity of the human masticatory muscles during nocturnal sleep (Untersuchungen der menschlichen Kaumuskeltätigkeit während des Nachtschlafes). *Hans Gert Neubauer. 1958.* DR.MED.DENT. *University of Kiel, Germany.*

Vitamin E and periodontal disease (E-Vitamin und parodontale Erkrankungen). *S. Loos. 1958.* FACHARZT ZAHNHK. *University of Vienna, Austria.*

Physiologic balance of the upper jaw in relation to centric occlusion (Die physiologische Gleichgewichtslage des Unterkiefers in ihrer Beziehung zur zentralen Okklusion). *H. Back. 1958.* FACHARZT ZAHNHK. *University of Vienna, Austria.*

Bilateral duplication of the upper lateral incisors: report of case (Über einen Fall von beidseitiger Verdopplung der oberen seitlichen Schneidezähne). *M. Miclavez. 1958.* FACHARZT ZAHNHK. *University of Vienna, Austria.*

Reimplantation of teeth in modern dental practice (Die Reimplantation von Zähnen in der modernen Zahnheilkunde). *K. Keresztesi. 1958.* FACHARZT ZAHNHK. *University of Vienna, Austria.*

Hypoplasia of the left half of the lower jaw, associated with syngenic defects: report of case (Über eine Hypoplasie der linken Unterkieferhälfte mit syngenetischen Begleitfehlbildungen). *H. Kinast. 1958.* FACHARZT ZAHNHK. *University of Vienna, Austria.*

Pathogenic effects of metals and of synthetic materials in the oral cavity (Über pathogene Wirkungen von Metallen und Kunststoffen in der Mundhöhle). *H. Langer. 1958.* FACHARZT ZAHNHK. *University of Vienna, Austria.*

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